The Citrus Industry

Issued Monthly

Representative of every Interest
Representing no special Interest

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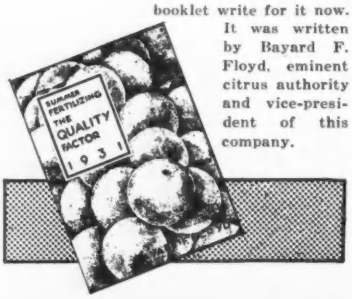
And for all other fertilizing purposes you can pin your faith to the IDEAL brands, too. Their reputation for dependable, profitable results is as great among field and truck crop and tobacco growers as among citrus men.

If you have not already received a copy of our 1931 Summer citrus booklet write for it now. It was written by Bayard F. Floyd, eminent citrus authority and vice-president of this company.



Because growers frequently have problems in the use of fertilizers, insecticides, sprays and spraying machinery we maintain a staff of expert field representatives to give advice when needed. Write if you would like to have one of them call without obligation to you.

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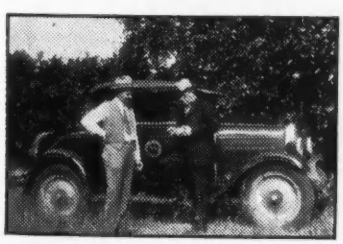
How will you stand when the gavel falls?

Mr. Z. Spinks of Leesburg, Lake Co., whose Pineapple and Temple oranges, which have been called the best in the United States, topped the New York market. Read Mr. Spinks' letter in the next column.



Use the Free A.A.C. Field Service

LET us look ahead to that morning at a New York Citrus Exchange, when the auctioneer, knocking down shipment after shipment, calls another number—and your fruit is for sale!

There sit the buyers, 20 rows of them, with lists in their hands. Which fruit is good? Which is *better?* They know. They've seen it all. And how the price reflects the quality! The great mass of fruit is average quality and the range of bidding is narrow.

But suddenly the auctioneer calls a number and the room is ablaze with excitement. Fifty men stand on their seats shouting their bids. Up—up goes the bidding—*lucky the grower who grew this fruit*—higher, higher—*gone!*

Through this room your fruit passes. When the gavel falls—the sale is made, your price is set. Too late then to do the things you might have done. Too late then to give your fruit that little extra margin of quality that gets the big margin of profit. But not too late NOW.

The only way to have bidders fighting for your fruit is to produce the right kind of citrus. Take the case of Mr. Z. Spinks of Leesburg, Lake Co., whose Pineapple and Temple oranges topped the New York market January 21st. As published in the *New York Daily Fruit Reporter,* Mr. Spinks' average sales returns were $5.28 a box, as against $4.43 for the next best fruit.

Does quality pay? Read Mr. Spinks' letter:

"Volumes have been written about 'quality fruit' but here is concrete evidence in price received for superior quality fruit.

"As you know, my fruit was grown with 'AA QUALITY' Fertilizers. There are many factors entering into the successful quantity production of quality fruit, but there is no factor more important than the plant-food requirements of the trees and fruit. My experience over a number of years is that 'AA QUALITY' Fertilizers will do the part expected of fertilizers in growing maximum crops of the best fruit."—*Z. Spinks,* Feb. 2, 1931

Every ton of "AA QUALITY" Fertilizer and every A. A. C. Co. fertilizer recommendation is backed by years of experience with Florida crops and soils. To make that experience available to the grower, we organized our free A. A. C. Field Service. That service is yours for the asking. A postcard to our Lakeland office will bring a Service Man to your door.

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"AA QUALITY" FERTILIZERS

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Is YOUR Name John Smith?

Call him John Smith—he's just an ordinary, average Florida citrus grower. His grove is kept well enough; he sees to the spraying, fertilizing and cultivating all right and his trees bear well enough, so that almost every year he has a pretty good crop. But he doesn't seem to make any money from his oranges and grapefruit.

Several years ago John had an unpleasant experience, when the Florida Citrus Exchange handled his fruit. He lost money, and he hasn't played with the Exchange since. Independents, or crop buyers have taken his fruit, paying about what they pleased, and John took what they gave him. No more cooperatives for him, John declared; that one experience several years ago cured him, he says.

And John Smith simply can't see and realize that he is standing in his own light; and not only that, but he's standing in the light of a lot of other small growers all over the citrus belt of Florida.

The Florida Citrus Exchange of today and tomorrow is no more like the Exchange of ten years or so ago than the airplane of today is like the one the Wright Brothers used to fly. It is a different sort of organization, a different set-up, different mechanism—and it's the only salvation for Florida's basic industry, citrus.

In years past, the Citrus Exchange lacked almost everything but a name. It had no adequate grower support, it had no proper long time financial support, it hadn't much influence with the railroads—in short, it was a good deal like a first class automobile with no gas, the gas, in this case, meaning the propulsive power of money. Many of the growers were afraid of it, frankly skeptical as to its ability to function. Many other growers openly scoffed at it, declaring it was "just another money-making scheme to pay big salaries to a lot of people who didn't know a darn thing about growing or selling citrus fruit."

Few growers today realize the handicaps under which the Exchange of those days tried to carry on—lack of funds, inability to borrow money except on usurious terms, absolute indifference, if nothing worse, from the growers themselves.

But the Exchange, the cooperative idea was right. It was right then, and it is right now, and always will be right. The Florida Citrus Exchange, in its present setup is a real, working organization. No more will it be compelled to beg and beseach banks for short term loans on deals that called for the last eye-tooth, almost the last drop of blood. The Florida Citrus Exchange today is the ONLY organization of Florida citrus growers and shippers that can obtain long term loans on low interest rates from the Federal Farm Board. That makes present and future financing certain. Not another selling organization in the State of Florida can obtain loans from the Federal Farm Board for financing the citrus crop.

The growers of a few years ago were not wholly responsible for the conditions in which the citrus industry found itself year after year. They—the John Smiths of that time—did not know they were standing in their own light when they refused to sign up with the Exchange, or when, after trying it for a year or two, they dropped out. They weren't familiar with the cooperative idea, they didn't know how to figure production costs, they had no way of watching the markets. All they knew was to grow the fruit and then to sell it to somebody who would give them some money for it. Nor were the banks wholly to be blamed for absence of a spirit of cooperation. Florida has some peculiar banking laws and practises; citrus fruit, in the absence of any sort of system of marketing was a highly speculative commodity and bankers are conservative folk. So the Citrus Exchange of other days found itself hedged in between a lot of conditions which it didn't create and was powerless to remedy or change. Nothing was altogether responsible for those conditions. They seemed always to have been a part of the business of producing and marketing citrus fruit—a perfectly natural sort of disease for which a cure hadn't been found.

Things are different today. Instead of resembling a fine automobile with an empty gas tank and no filling station in sight, the Exchange of today and tomorrow is a more modern machine, plenty of oil, gas tank filled, and ra'ring to go. It has no need of worrying about proper financing; the Federal Farm Board will see to that. Loans are easy to negotiate now; the only factor that will unduly limit them will be limitation of grower-membership. So much can be borrowed by the Exchange, on long time and easy terms, if that organization has absolute control of 55 per cent of the crop; so much more if it controls 65 per cent, and abundance and plenty if the Exchange has control of 75 per cent of the state's crop. That, in effect, is the way it works out. And, as has been said, the Florida Citrus Exchange is the ONLY grower-shipper cooperative organization that can obtain loans of government money, through the Federal Farm Board, for financing the citrus crop from grove to consumer.

Yet there are many John Smiths still standing in their own light and cutting off the light from others, too. There always will be a few of them, probably. Their numbers will grow less, year by year, as more John Smiths learn the facts about cooperative handling and marketing of the crop, and federal financing of growers by the Farm Board and through the Exchange And as soon as, say, 75 per cent of the state's citrus growers, including a lot of the John Smiths sign up with the Exchange and stick for, say five years at least, just so soon will the grove owners cease being patrons of the makers of red ink. Cooperation and steadfastness, with 75 per cent Exchange control of the citrus crop, are the gas that will keep the machine traveling along the highway of grower-prosperity.

FLORIDA CITRUS EXCHANGE

TAMPA, FLORIDA

The Citrus Industry
EXCLUSIVE SPECIALIZED CITRUS PUBLICATION
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Cryptolataemus Lady Beetles As a Control for Mealybugs

By W. L.Thomson, Assistant Entomologist Florida Experiment Station at Meeting of State Horticultural Society

It has often been said that if the human race is to prosper and live, a continual war against insects must be waged. Fortunately nature has come to our aid in this matter, as she has done in many others, by supplying insects that prey upon others.

During the past year the Department of Entomology of the Agricultural Experiment Station secured from the California Experiment Station a colony of ladybeetles known as the "Mealybug Destroyer" or scientifically called Cryptolaemus montrousieri (muls.).

According to Essig's, Insects of Western North America, "this species of ladybeetle was introduced from Australia into California in 1892 by Albert Koebele and has proven to be one of the most proficient enemies of many kinds of mealybugs in California where it is firmly established."

Although this species of ladybeetle has become established in California, millions are propagated each year to be liberated in groves infested with mealybugs. Mass production of the Cryptolaemus ladybeetles in California was started in 1916. The successful demonstrations of the value of artificially propagating and distributing these beetles has led to the establishing of fourteen insectaries in Southern California.

To control almost any insect pest by means of predators or parasites, one should have these agents in the field when the infestation is in its infancy. Once an infestation is well under way, the introduction of parasites and predators is of little value in controlling the pest during that season. The Vedalia ladybeetle (Rodolia cardinales Mulsant), predator of the Cottony Cushion Scale, is an exception. It must be understood that when a parasite has destroyed its host it often dies of starvation which is the reason for reintroduction of some parasites each year, or when the occasion arises.

The Cryptolaemus adults are about one-eighth of an inch long; the color is black with the head, prothorax, and tips of the wings a reddish color. The eggs are very small, oval in shape, and laid singly among the mealybugs. The larvae are yellow and covered with white waxy filaments. One not acquainted with the appearance of the larvae might easily mistake them for mealybugs, especially when they are small.

Since these beetles have been received at the Citrus Experiment Station at Lake Alfred, a number have been reared and some liberated with the idea of establishing them in Florida and to become acquainted with the methods of rearing them in insectaries, or such places that can be made available.

In rearing these ladybeetles the common citrus mealybug, Pseudococcus citri (Resso), was used as the host, and potato sprouts were used as the host for the mealybugs. The method of propagating these predators was copied, to a great extent from a system used in California. Valuable information was obtained from a manuscript, "The Mealybugs Attacking Citrus and Their Control by the Biological Method", by Harry S. Smith and H. M. Armitage of the California Experiment Station.

As stated above, the mealybugs were reared on potato sprouts. The potatoes were planted in trays or flats 14½" x 16" x 4". ¾ inch material was used. The flats were constructed so that the sides extended out ¾ of an inch from the bottom boards, making it possible to use the sides of the flats to slide them in and out of the racks. The soil used for planting the potatoes was obtained from a cow lot. The flats were filled about two-thirds full of soil. When the potatoes were planted, they were pushed down firmly into the soil, watered, and then covered with about one-half inch of sand. It was not necessary to wet the soil again. In some of the first plantings the sprouts were watered after they came up, but later a form of damp-

(Continued on page 28.)

Enforcement of The Plant Quarantine Act

By Lee A. Strong, Chief, Quarantine and Control Administration

(Delivered at the 44th Annual Meeting of the Florida State Horticultural Society, Miami, Fla., April 16, 1931.)

The Plant Quarantine Act which became effective August 20, 1912, was the culmination of several years of effort to have some type of legislation passed by Congress that would serve to protect the agriculture and horticulture of the United States from plant pests from foreign countries.

In submitting a report on this bill on May 6, 1912, the House Committee on Agriculture in the Sixty-second Congress outlined as conditions which called for this legislation the following:

"The United States is the only great power without protection from the importation of insect-infested or diseased plant stock. Referring only to European powers, Austria Hungary, France, Germany, Holland, Switzerland, and Turkey prohibit absolutely the entry from the United States of all nursery stock, and admit fruit only after a most rigid examination shows freedom from infestation, and most of the others have very strict quarantine and inspection laws and the same is true of the important British and other colonial possessions.

"The United States thus became a sort of dumping ground for refuse stock. Diseased livestock may be and are excluded by law but diseased and insect-infested plants have no bar against introduction. More than half of the important insect pests of fruits and farm crops are of foreign origin and these now occasion a tax of nearly half a billion dollars annually. A properly enforced quarantine and inspection law in the past would have excluded many if not most of these insect enemies and also many plant diseases."

The Committee further said:

"While as just indicated most of the important seriously injurious insects and plant diseases which are now levying an enormous yearly tax on agricultural productions, have been introduced from foreign countries, there are still many other insect pests and plant diseases which may be excluded. There are improtant orchard and fruit pests in Europe and Asia, the entry of which can be guarded against. There is also just now a special danger from introductions from Asia where conditions are little known and where pests are very apt to be new and usually destructive."

After referring to a number of serious pests which had been brought into the United States in the absence of any quarantine regulation, and indicating something of the damage which had followed these introductions, the Committee said:

"Many of the plant diseases and insect enemies of the old world now established in this country could undoubtedly have been excluded and thus would have given this country a tremendous advantage for a long period in augmenting the quantity produced and lessening the cost of production. The pest cannot be altogether remedied but the future can be safeguarded and this act would go a long way toward accomplishing this end. With the exception of importing nurserymen there has been practically universal demand for this legislation. The Horticultural Societies of many States have demanded it and have come solidly to its support."

Following this favorable committee report, the Congress of the United States passed the bill and it became a law in August, 1912. It is of record that since the passage of the Plant Quarantine Act, but three major horticultural and agricultural pests have become established in this country—the Mexican fruit fly, which came across the Mexican border and heavily infested the citrus orchards of the Lower Rio Grande Valley of Texas, but which has apparently been completely exterminated, no infestation having been found during the past two crop seasons; the pink bollworm of cotton, which likewise came into the United States from Mexico, and which has been exterminated over large areas, but which still exists in serious form in the cotton fields in the Big Bend area of Texas, in a modified form in certain areas in New Mexico, and in the Salt River Valley of Arizona; and, the Mediterranean fruit fly which was found in Florida two years ago but which has been so successfully fought that only three very minor infestations have been November, 1929, one in March, 1930, and the last, July 25, 1930.

In contrast to this condition it seems important to point out that in the few years immediately preceding the passage of the Plant Quarantine Act, there came into this country such serious pests as the European corn borer, the chestnut blight, the Japanese beetle, the white pine blister rust, citrus canker, the alfalfa weevil, the oriental fruit moth, and others of similar destructive nature.

Referring again to the report of the House Committee on Agriculture, of May 6, 1912, one sentence will bear repetition. "There is also just now a special danger from introduction from Asia where conditions are little known and where pests are very apt to be new and unusually destructive." Two of our most important introduced insect pests had undoubtedly been brought in from the Orient just prior to the passage of the Plant Quarantine Act. We know the oriental peach moth came to us from Japan. We know it came in on that beautiful plant, the flowering cherry, which is even now in its full glory of bloom on the driveways bordering the Potomac in Washington. There is no more gorgeous sight in any horticultural setting in this country. Many thousands of people enjoy the beauty of the plant and its bloom. What of the pest, the oriental peach moth, that the flowering cherry brought us? It has now spread to twenty-five States

and presents a real problem in control. Again, the Japanese beetle brought from Japan in iris roots in soil during the few years prior to the placing of restrictions on the importation of plants from abroad presents another tremendous problem. Had there been any quarantine regulation in effect at eastern ports of entry when these importations were being made, soil would have been excluded and this pest would have been prevented entry. The Japanese beetle is a troublesome and discouraging pest, now present in nine States and the District of Columbia. In a circular (No. 180) issued by the Bureau of Statistics and Inspection of the New Jersey Department of Agriculture in January, 1931, there appears the following foreword:

"The Japanese beetle (Popillia Japonica, Newm.) has become an insect of economic consequence to the States in the New York and Philadelphia metropolitan areas and is of considerable concern to the rest of the country. This circumstance has evolved because of the costly and annoying depredations of the insect, while uncontrolled, on economic and or namental plants within the heavily-infested states in anticipation of an invasion by this destructive insect, which they believe inevitable.

"The very discouraging experiences of those who were interested in the growing of susceptible vegetation in the Riverton area during the early American days of this insect will stamp it as an insect of great potential destructive capabilities. However, the recent improvements in spray mixture formulae, more widespread spraying for foliage protection and lawn treatment for protection against the grubs, more extensive use of traps, and the successful establishment of many parasite colonies have reduced the beetle population, even in the heavily-infested area, so that satisfactory protection readily can be realized. In fact, the periphery of beetle advance represents today the most troublesome phase of the control work, principally because of the local novelty of the insect and the erratic use of control measures. A prediction that the Japanese beelte will, within the next ten years, be shifted from the class of insects of major economic importance to the one of minor minor economic importance is not believed to be too optimistically visionary."

It is to be everlastingly regretted that the Plant Quarantine Act was so long delayed in passage because some of our present ills could have been avoided.

What is the Plant Quarantine Act? It is not a mere authorization granted by Congress to enforce certain regulations issued under that act. While the Secretary of Agriculture is of necessity given certain discretion in the placing of regulations, the Plant Quarantine Act is in fact a mandate issued by Congress to the Secretary of Agriculture.

The Act provides among other things, that it shall be "unlawful for any person to import, or offer for entry into the United States, any nursery stock, unless and until a permit shall have been issued therefor by the Secretary of Agriculture under such conditions and regulations as the said Secretary of Agriculture may prescribe." It is further provided that "Whenever in order to prevent the introduction into the United States of any tree, plant or fruit disease or of any injurious insect new to or not theretofore widely prevalent or distributed within and throughout the United States, the Secretary of Agriculture shall determine that it is necesasry to forbid the importation into the United States, of any class of nursery stock, or any other class of plants, fruits, vegetables, roots, bulbs, seeds, or other plant products from a country or locality where such disease or insect infestation exists, he shall promulgate such determination, specifying the country and locality and the class of nursery stock or other class of plants, fruits, vegetables, roots, bulbs, seeds, or other plant products which in his opinion should be excluded. Following the promulgation of such determination by the Secretary of Agriculture and until the withdrawal of the said promulgation by him, the importation of the class of nursery stock, or other class of plants, fruits, vegetables, roots, bulbs, seeds, or other plant products specified in the said promulgation from the country and locality therein named, regardless of the use for which the same is intended, is hereby prohibited."

A further provision is that "the Secretary of Agriculture is authorized and directed to quarantine any State, territory or district of the United States or any portion thereof when he shall determine that such quarantine is necessary to prevent the spread of a dangerous plant disease, or insect infestation, new to or not theretofore widely prevalent or distributed within and throughout the United States."

The Act contemplates therefore that the Secretary of Agriculture shall prescribe rules and regulations under which nursery stock may be safely admitted into this country from abroad. It contemplates further that if it is necessary in order to prevent the introduction of plant diseases or insect pests into this country from abroad, to forbid the importation of certain products into this country, that that shall be done. With respect to the placing of quarantines within the United States, the Secretary of Agriculture is not only authorized but directed to quarantine any portion of the United States when such quarantine is necessary to prevent the spread of a dangerous plant disease or insect infestation. That this is not hasty or ill-considered legislation, is evidenced by the fact that the bill was passed by Congress only after twenty years of effort. The first bill introduced in Congress for the prevention of spread of disease through the transportation of plants was introduced on January 15, 1892. Several successive bills were introduced but none became law until August, 1912, when the Plant Quarantine Act was passed.

Under the terms of the Plant Quarantine Act the Department has undertaken the responsibility of preventing the entry into this country of injurious plant pests. Obviously, a reduction in the volume of importations of plants proportionately reduces the risk of pest introduction. Therefore, in order to carry out the purpose of the Act the Department has found it necessary to limit the importation of plants from abroad to those which are necessary to the propagating needs for the horticulture development of this country. Certain rules have been laid down under which plants may be imported. Criticisms have naturally resulted on account of the restrictions, one of which is that in the issuance of permits the amateur grower is being discriminated against in favor of the commercial nurseryman. Under present conditions amateurs may import plants when the person is widely or nationally known as a specialist in or as maintaining a fairly complete study or experimental collection of some special class of plants as roses,

(Continued on Page 30)

The Importance of Calcium In Citrus Culture

By Gray Singleton, Consulting Chemist, Fort Meade, Florida

For many years it has been noted by Florida citrus growers that the citrus fruit and citrus fruit trees grown in different parts of the State exhibit different characteristics. For instance, the fruit grown along the Indian River, in Dade County, certain sections of Manatee County and parts of Pinellas County is supposed to have a thinner skin and more juice per size than the fruit grown on the Norfolk sands of the "Ridge" section. It is also claimed by growers in the coastal sections that their fruit has a better color and higher aroma, or flavor, than fruit grown elsewhere.

There seems to be some basis of fact in the contention of these growers as well as in the claims of the tangerine growers of the Brooksville section and the Pineapple growers of Marion County and parts of Lake County that their fruit takes on a deeper red color on maturity than fruit from other localities.

On investigating these claims we find that the rule does not hold good for any particular section but that it does hold on certain types of soil. In Marion, Lake and Pinellas we find that the fruit grown on Norfolk soil is no different from that grown on the same type of soil in any other part of the state, but the fruit grown on heavy "hammock" soil, overlying limestone, seems to be quite different.

It is important to note that all of these soils which yield a thin skinned, highly colored and highly flavored fruit are on a calcarious base rather than a sand base.

It has also been noted that fruit grown on soils with a limestone or shell base seems to mature earlier than the same varieties grown on sandy soils. In fact, before the advent of the arsenic spray, fruit from the calcarious soils matured several weeks ahead of fruit from the sandy sections.

Some years ago the growers noticed that fruit grown on sandy soil, but sprayed heavily with lime-sulphur, exhibited many of the characteristics of fruit grown on limestone soils. Color and texture were better, the rind was thinner and the fruit matured earlier. This effect was generally attributed to the polysulphides of sulphur, but the fact was also noted that dusting with sulphur did not give the same results as spraying although the insecticide effect seemed to be fully as good. It was unquestionably true that fruit heavily sprayed with lime-sulphur matured earlier, has better color and texture, had a thinner peel and therefore more juice per size than fruit dusted. Some years ago the writer was employed by a group of large growers in the State to carry on systematic research work to explain, if possible, the differences noted and possibly to develop legitimate methods of producing a normal earlier maturity, thus lengthening the shipping season and getting away from the use of arsenic.

The first step was to vary the amounts of lime and sulphur in the spray. It was found that increasing or decreasing the sulphur made no difference, so far as could be determined, in the physical condition of either fruit or tree. On the other hand, increasing the lime content of the spray had a very marked effect, both on the tree and on the fruit. As soon as it was definitely ascertained that it was lime that was causing the desired effects a long series of experiments was started which has been running for six years. The work is far from being completed but the data secured warrants a preliminary report from which you can arrive at your own conclusions.

The first experiment was to take a number of trees and spray them with solutions containing varying amounts of lime and sulphur. This established the fact, as stated above, that it was lime that caused the difference. The next step was to take a number of trees and spray half of each tree with solution of lime varying from one to fifty pounds of hydrated lime in two hundred gallons of water. This was done about May first and in every case where more than two pounds of lime was used to two hundred gallons of water there was a marked improvement in the condition of both tree and fruit on the sprayed side as compared to the unsprayed part. The most striking difference was the dark green foliage and deeper colored fruit on the sprayed side while the foliage and fruit on the unsprayed side remained pale. On a number of trees it was noted that the sprayed side put on a flush of new growth and a few of them bloomed while the unsprayed side remained more dormant. This experiment was conducted in a grove that was not responding well to fertilization. It had been fertilized but the owner said that it was not "feeding well."

Another difference, which was entirely unexpected, was noted in this grove. The fruit and foliage on the unsprayed side of these trees showed much melanose. The sprayed side, where ten pounds or more of lime was used to two hundred gallons of water, showed practically no melanose on fruit or new growth. Careful examinations showed no damage to friendly fungi and no scale infestation followed. To check this observation three test plots were laid out. Plot No. 1, was sprayed with Bordeaux made from four pounds of bluestone and twelve pounds of lime to fifty gallons of water. Plot No. 2, had a Bordeaux made from four pounds of bluestone exactly neutralized with lime. Plot No. 3, was sprayed with twelve pounds of lime to fifty gallons of water. The remaining part of the grove was used as a check. The four plots, including the check, contained five acres each. The test was made on early grapefruit.

Plot No. 1, was severely damaged by scale in spite of three sprayings with oil and the copper persisted on the foliage for fifteen months.

Plot No. 2, was lightly infested with scale but this was controlled with one oil spray. Copper seemed to be gone in about three months.

Plot No. 3, showed no more scale than the unsprayed check, which was negligible.

Fruit and foliage on the three sprayed plots were practically free from melanose, while the check plot was damaged considerably, both as to fruit and foliage.

The physical conditions of Plots 2 and 3 were about the same. Both showed a darker green than the check.

The next step was to take ten

groves in one or more of which were planted practically all of the standard varieties of orange and grapefruit. These groves were sprayed twice, the first time in May and the second time in September. Each time ten pounds of lime was used in two hundred gallons of water. Seven of these ten groves showed markedly earlier maturity than normal. Seedling oranges gave practically the same analysis November 15th as unsprayed seedlings showed January 15th. There was no inhibition of acid formation as is the case with arsenic and the flavor, if anything, was actually better than normal fruit. Ten pounds was selected as the amount of lime to use because in some cases, where larger amounts were applied, the rind was so thin that serious splitting and creasing occurred and the fruit did not ship well. In no case was tree damage noted, even where fifty pounds of lime was used to two hundred gallons of water. Several of these groves had trees with typical cases of dieback. In all cases they seemed to be benefitted and subsequent growth was well rounded and normal.

Juice measurements were made through the season on these ten groves and, on medium sized fruit, the increase, on both oranges and grapefruit, was from seven to nine per cent over fruit of the same size from unsprayed groves. Due to variation of seed content and thickness of rind no definite trend could be established on very small or very large sizes. In the early stages of maturity, both in orange and grapefruit, the increase in juice content was often twenty per cent over that of unsprayed fruit. Pineapples did not react as well as seedlings except as to color of fruit.

It was noted in these experiments that Valencies sprayed with lime do not turn green in spring and that they seem to remain on the tree much longer without drying. Tangerines and Temples seemed to show the same tendency to hold juice later and Tangerines showed a definite tendency to size up earlier in the fall. The color and texture in all oranges, tangerines and Temples was improved, but in some cases earlier maturity was not up to expectations. Later experimental work seems to show that deficiency in magnesium, or iron, or both, may affect maturity. Work along this line has not gone far enough to justify a definite statement.

It was known from previous experience that the application of lime directly to the soil would improve the appearance of the fruit, giving it a deeper red color, but it was also known that this practice is dangerous to the trees.

Various combinations of lime were tried as fertilizers. Hardwood ashes and bone meal gave the characteristic dark green color to foliage if applied in considerable amounts. Calurea gave the same color and good results were gotten from a mixture of three hundred pounds of calcium cyanamid with one ton of pulp made from culled fruit. This material is now being manufactured by a number of canneries from refuse. All of these materials semed to improve the physical condition of the tree without the subsequent damage characteristic of direct applications of lime and all seemed to show a trend toward earlier maturity. The best results were gotten from a combination of a lime bearing fertilizer and a direct lime spray.

In order to cut down expense of spraying experiments were made using a combination of the usual lime-sulphur with added amounts of hydrated lime. The insecticidal value of the lime-sulphur seemed to be in no way diminished and the control of melanose was markedly improved. A number of experiments were tried on lemon scab but in all cases there was just as much scab on the sprayed as on the check plots.

Where calcium cyanide is used to kill Spanish Moss or prevent greasy melanose lime may be added, but it is not recommended that it be used with oil or Bordeaux. In some cases where lime, lime-sulphur and cyanide have been used there seems to be a definite killing of scale insects. This spray will burn young foliage and its use has not sufficiently been tested to warrant a definite statement as to what it will do. Cyanide, without lime, seems to have no effect on maturity. Lime alone seems to be definitely toxic to the Florida wax scale, even more deadly than oil, but two applications are necessary, as the young under the old scale are not killed by the first application.

In summing up I would say that from what experimental work has been done it seems that lime can legitimately be used to lengthen the shipping season, both in fall and spring. It is markedly effective in causing early maturity on only about seventy per cent of the groves where it has been tried, and on lemon root and sandy soil it is not always effective in holding juice in tangerines and Temples. Its use is now standard practice on several thousand acres of groves and in all cases it has improved the color, texture and eating qualities of the fruit as well as giving a markedly beneficial reaction in the physical condition of the tree. The effect of lime is in no way similar to arsenic. It benefits both the tree and the fruit, while a heavy spray of arsenic damages both and prevents the formation of acid and flavor. Lime is not nearly so effective as arsenic in getting fruit to pass the maturity test but the superiority of the fruit, especially oranges, and the benefit to the tree more than make up the difference.

This work was financed in part by Gentile Brothers of Orlando, but principally by Mr. L. Maxcy of Frostproof, and Mr. Barnard Kilgore of Clearwater, and is made public at the request of Honorable Nathan Mayo, Commissioner of Agriculture for Florida.

ORNAMENTAL TREES

Pongam (Pongamia pinnata)
Portuguese Cypress (Cupressus lusitanica glauca)
Papaw (Carica papaya)
Queensland Nut (Macadamia ternifolia)
*Rubber or Fig (Ficus spp.) in variety (altissima, elastica, brevifolia, nitida, benpamini, sycamorus, etc.)
Royal Poinciana (Poinciana regia)
*Sausage Tree (Kigelia pinnata)
*Spathodia (Campanulata)
*Tamarind (Tamarindus indica)
*Thespesia populnea
Woman's Tongue Tree (Albizzia lebbeck)
*Ylang-Ylang (Canangium)

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Oneco, Florida

Citrus Grove Practices on The Rocky Lands of Dade County

By Charles H. Steffani, County Agent, Homestead, Florida, at Meeting of State Horticultural Society.

When asked to prepare a paper before this Society on Grove Practices on the rocky soils of South Dade County or what is known as the Red Land District, I hesitated somewhat, due to the wide variation in opinion among the growers, and that no definite general practices either in grove culture or fertilization has ever been conclusively worked out.

The paper which I am about to present is taken from my notes and a survey made of twenty-five growers having good producing grapefruit and orange groves in the Redland District. The trees in these groves varying in age from 8 to 15 years, and cover 690 acres. Practically all of these groves were planted on land that had been scarified either before or after planting with a five-ton V shaped plow with 3 inch steel teeth, drawn by a 40 horsepower steam tractor. Some of these groves were surface dragged with a large iron tractor wheel, laying flat on the ground, and pulled with a 60 horsepower catapillar tractor, breaking off the top surface of rock and smoothing the surface for future cultivation. The holes were blasted with dynamite from 2 to 4 feet deep made before planting the trees.

A natural cover crop of natal grass and shepherd needles are the principal vegetation grown in these groves. 23 of these 25 groves practice mowing this material, 2 to 4 times a year, applying the material mowed around the trees for mulch. The mowing is usually done after fertilization. The cost of mowing running from 75c to $3.00 per acre, with an average cost of $2.00 per acre, the variation in cost due mostly to some growers using hand labor while others use mowing machines. Some of you may wonder in your minds that instead of growing that natural cover crop in our groves, why we do not make a general practice of growing crotalaria, beggarweed or some other Nitrogen gathering cover-crop during the summer months in our old groves where the roots extend to the center of the rows, it can readily be seen in order to plant these cover crops from year to year, it would be necessary to run a disc-harrow or a heavy wheel drag over this rock to loosen it sufficiently to plant the seed. In this case it would be harmful to the feeding roots that are close to the surface.

Pruning

Practically all growers practice pruning the trees in their groves, in most all cases this work is done during the summer months, from May until September, due perhaps to the fact that most growers have more time during the summer months to do the work. About 20% practice pruning during the months of December and January.

It is interesting to note in this survey that the number of growers who spray for scab and rust mites are about evenly divided with those who do not spray. Getting down to actual figures 60 per cent spray for scab and rust mites, and the other 40 per cent of these growers do not spray. The time of spraying for citrus scab by these growers, runs from November to February, the largest percentage spraying in January. In spraying for rust mites most of the growers sprayed in April, and a small number sprayed again in November on oranges. The cost of applying both of these materials ran about the same, from $4.00 to $6.00 per acre, each spraying.

Fertilization

Observations made covering the growers experiences for the past two years with ready mixed fertilizer formula, a great variation was found to be used by these growers. To be exact ten different ready-mixed fertilizer formulas were used, with little difference in Nitrogen and a wide variation in the amount of Potash. The Superphosphates in all formulas used was 8 per cent. The variation in Nitrogen was 2 per cent, the formula lowest in Nitrogen carried 3 per cent, and the highest 5 per cent, running about 60 per cent chemical and 40 per cent organic, with some few cases 50 per cent chemical, and 50 per cent organic. The variation in Potash was 5 per cent, the formula lowest in Potash carried 3 per cent, the highest carried 8 per cent. 75 per cent of these growers use sulphate of ammonia or nitrate of soda and sulphate of ammonia mixed on a 50-50 basis for the very early Spring application in late December or early January, the largest applying it early in January, following this, the regular spring application of fertilizer is applied in late January, following this, the regular spring application of fertilizer is applied in late January or early February, from four to six weeks after the early spring application of Nitrogen was applied. The majority of these growers used a 4-8-5 fertilizer formula. The next largest group of the 25 growers, using a 5-8-5 formula. The summer application of fertilizer was applied in April and May by the majority of the growers, the largest number being about equally divided between fertilizer formulas 4-8-5 and 4-8-8. The fall application of fertilizer applied by the majority of the growers in October and November was the same formulas, 4-8-5 and 4-8-8, as applied in April and May.

In selecting these 25 growers from a group it might be advisable to call your attention that they were selected due to the fact that they all have been successful in their grove operations, and have good producing groves in good condition, regardless of the variation in their fertilization, and yet the majority are so near to one another in their fertilization and general grove practices, it appears from this information that until some definite plan of work is carried out by our Experiment Station in grove culture and fertilization, that it will be well to follow the general practices of grove culture and fertilization practiced by the majority of the successful growers as outlined above.

Standards of Maturity In Citrus Fruit

By Clifton Bolick, Fort Myers, at Meeting of The State Horticultural Society Held in Miami

The first static in the domestic circle in the family was about fruit. Whether it was an apple, an orange or a grapefruit, or whether it was mature or immature, is a matter of conjecture. Certain it is that it resulted in fig leaves. This matter of standards of maturity in citrus fruits in Florida comes dangerously near convincing us that, as some claim, Florida is Paradise, and if Adam does not reform and stop his meanness and quit passing the buck, we will soon be in the fig leaf stage. That same habit of eating has come right down the human line to us. There is larger range to satisfy our appetites, and we choose those fruits that are most pleasing to our tastes.

It would seem that the Standard of Maturity in citrus fruit must conform to the taste of the millions for whom they are grown to be eaten. There was a time when citrus fruits were not offered from Florida to the consumer until nature indicated maturity by practically full color of the peel and the buyers came down to Florida to seek that kind of fruit to start the season right and keeping Florida fruits moving into consumption. That is the rational test, nature makes few mistakes, if any, but she does produce some monstrsities. One of these is the Adam that defies the laws of nature to destroy the quality of Florida citrus fruit, by taking them from the tree and offering them to a willing consumer before they are fully matured. The consumption of Florida fruit seems unlimited when they are fully ripe and the consumer is the real arbiter of the standard of maturity. From year to year we are confronted with the evil habit of sending immature fruit to market. This fruit gets into general distribution and shuts off the buyer who wants real Florida citrus fruit and the consumer and the buyer as well goes on a strike and buys and eats no more until he is given some good fruit. The past season we have given millions of boxes to those who have been disgusted with the immature fruit which has been foisted upon them as ripe fruit.

To overcome this insane defiance of natural law, for twenty years Florida has been trying by legislation to establish standards to permit only palatable fruits going to the market, in order that Florida fruits may go into liberal consumption at the beginning of the season, but so long as man can violate the laws of nature and the state for a profit to themselves, they seem to be able to find others who will supply them with fruits to destroy the market to the undoing of the industry and they pass the buck to criminality.

There are wide diversions of opinion in the matter of maturity of citrus fruit. There always will be. In establishing standards these have to be taken into account. This society went on record favoring a restraining law in the moving of citrus fruit from the state that were not up to the given standards of maturity. There was a bitter fight before the legislature in 1911. A very inadequate law was passed with 8 to 1 for oranges and 7 to 1 for grapefruit, providing they showed two- thirds color on the trees, indicating maturity, was to be exempt from the acid test. The color test nullified the law besides, with. only four inspectors, politically appointed, the shipper became the only judge of what was to be shipped. From time to time new laws or amendments to the other laws have been passed and each year this same problem is with us. The standards that we have or are trying to get seems to be as near as can be had to proper maturity and one of the weak features is the clause in the passed law which provides the lack of enforcement.

Until 1929 there was no standard of maturity for tanegrines. The present law was passed by the legislature in 1929 and fixed a standard of 8 to 1 sugar to acid and all tangerines being deemed mature after November 15th. The 16th of November found 500 cars or more ready to ride to market. This standard for tangerines was deemed necessary to stop packers from cooking them in the coloring room before they were mature, destroying all value of the fruit and paralyzing the market. Since I am discussing tangerines, I will take up the discussion of tangerines for the proposed new bill following up with oranges and grapefruit.

The new standard as provided and recommended by the Florida Citrus Exchange Legislative Committee and the Composite Committee of the State of Florida which is composed of two members of the Florida Citrus Exchange, two members of the Florida Citrus Clearing House Association, two members of the Chamber of Commerce of Winter Haven, two members of the Fruitman's Club and two members of the Committee of Fifty, making a committee of ten. This committee is composed solely of growers of citrus fruits who have labored strenuously to try to work out a fair and equitable standard of maturity that will be fair to all citrus sections of Florida. This committee recommends the new standards on tangerines of 7½ to 1, the season to close on November 30th. It is the opinion of members of the committee that the same conditions that prevailed on November 16th last year will prevail on December 1st this year, providing this recommendation is passed. There are a number of larger tangerine growers in the state who believe the acid test in tangerines is not the right test, that tangerines should be picked for size and color, prohibiting the coloring artificially, that this will right the tangerine situation and I am informed that this recommendation is going to be submitted to the citrus committee of the Florida Legislature by some of the larger tangerine growers.

Before I discuss the standards of oranges, a factor to reckon with is the deadly arsenic spray and applying other forms of arsenic, which destroys the acid and likewise destroys the value of the fruit. It is hoped that the arsenical law can be enforced and the users of arsenic spray be prosecuted, by not allowing this fruit to go to market.

There has been considerable discussion relative to what is the proper standard of maturity on oranges. Many recommendations are that a

(Continued on page 14.)

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ARE WE "WANDERING AFIELD?"

Having just passed through a period of some three years of rather trying times, it is natural that citrus growers should be looking about for some remedy for the ills which have beset them, but in their anxiety for quick relief we are wondering if we have not "wandered far afield" and lost sight of the most important of all problems confronting the industry.

During the past few years we have heard much about improving marketing conditions. Many movements looking toward this end have been set in motion—and we have today the same old problems still unsolved. Right now we hear much talk and read many articles stressing the necessity of adopting grove practices which will provide "quantity production at minimum cost." Both of these matters are important; both should call for our best thought and our best effort—but we are never going to put the citrus industry on a sound and profitable basis until we make the production of **quality** fruit fruit the foundation of our efforts.

Reducing the cost of production is highly desireable—provided we can at the same time increase the **quality** of the fruit to the point where it will maintain its dominance of the markets in competition with other fruits. But increasing production and reducing costs, if it is to be done at the expense of **quality,** will prove a costly and ruinous procedure.

We are told that we are spending too much for fertilizers, that we are spraying beyond the needs of our groves. Possibly. Still, we have yet to see the grove which was improperly fed or the one which was infested by pests, which returned its owner an adequate profit.

With conditions as they are in the industry today, with normal production well up to the limit of normal consumption, the crying need of the industry is to so improve the **quality** and **appearance** of the fruit that the consumer will be led to consume more. That will take care of present production at a profit and we may then begin to worry about increased production.

However, the search for cheaper plant foods has not been without result. The past few years has witnessed the introduction of many new elements of plant nutrition, some good, some questionable and some whose value is yet to be determined. The danger is that in the search for cheaper plant foods, the citrus growers may be tempted to accept as conclusive, preliminary estimates which time may prove to be unwarranted. Federal and state research departments are carrying on experiments with numerous new elements of plant food, and preliminary reports are being issued from time to time. But until the experiments have been carried over a period of years, conclusive deductions cannot be made.

In the meantime, we have certain well defined grove practices, and certain well defined formulas which have been successfully demonstrated over a period of years. Where it has been demonstrated that, these practices and these formulas will produce fruit of high **quality** and superior **appearance,** it would seem to be the part of wisdom to continue such practices until new methods have been proven superior —or at least to experiment very carefully before applying new methods to an entire grove.

Fertilizer and insecticide concerns operating in citrus territory, maintain corps of efficient field men and grove experts whose business it is to make a careful and constant study of grove conditions. These field men co-operate in many instances with the workers at experiment stations and with county agents who are in close touch with local conditions in each of many citrus producing sections. Their counsel and advice is always available to the grower, and should, we believe, be more frequently sought and followed.

As the situation appears to us, the program most apt to prove of profit to the grower might be briefly outlined as follows:

(1) Produce fruit of the very highest possible **quality** and **appearance.**

(2) Apply those practices which have proven successful in producing such fruit.

(3) Watch constantly for new methods which may tend to increase the **quality** and **appearance** of your fruit.

(4) Experiment carefully with any new methods which bear promise of improvement.

(5) Adopt new methods **only** after they have been proven successful.

(6) Avail yourself of the counsel of grove experts of standing and character.

We believe that the grower who will adopt the above program will produce fruit of high quality and appearance. Having done that, he will have fewer worries about marketing, cost of production and size of the crop than the grower who produces inferior fruit.

STATE HORTICULTURAL SOCIETY

The Florida State Horticultural Society, after forty-four years of vigorous life and successful achievement, is still very much alive and an aggressive factor in the horticultural activities of the state. This was demonstrated a the recent meeting held in Miami. When announcement was first made that Miami, way down on the East Coast, far from the center of horticultural activities, had been chosen as the meeting place, many were inclined to believe that the attendance would be so small tha the meeting would be a failure. Even among the officers of the Society, this belief was privately expressed. Yet the meeting actually brought out one of the most satisfactory attendances in recent years, and in point of interest has been excelled by few of its predecessors.

In addition to the very interesting and important papers read at the meeting, those in attendance had the opportunity of visiting some of the noted horticultural centers of the Lower East Coast. Matheson Hammock Park, donated to the city of Homestead by the Deering Estate, the Homestead Golf and County Club and the home and grounds of David Fairchild were among the most noted of the places of interest visited by the delegates.

Too much cannot be said of the good work of J. S. Rainey, county agent, for his part in making the preliminary arrangements for the entertainment of the guests, nor of the excellence of the program of entertainment carried out by the local committees.

Owing to the unavoidable absence of President John S. Taylor, the meetings were presided over by Vice-President S. F. Poole. Gainesville was chosen as the next meeting place of the Society, the dates for which will be determined later.

The complete official register of the Society follows:

President—John S. Taylor.
First Vice-President—S. F. Poole.
Second Vice-President—Charles I. Brooks.
Third Vice-President—C. W. Lyons.
Secretary—Bayard F. Floyd.
Assistant Secretaries—W. W. Yothers and J. Lee Smith.
Treasurer—N. A. Reasoner.
Executive Committee—Frank Stirling, H. Harold Hume and W. L. Drew.

In connection with the meeting of the State Horticultural Society, the Sixth Annual Meeting of the Florida Rose Society was held, and this meeting proved of equal interest to those who love Florida flowers.

During the sessions of the Society, the Curtiss-Wright Company put on free airplane flights for such of the delegates as wished to view Miami and the surrounding territory from the air. Many of those in attendance took advantage of this opportunity to test their "air-mindedness."

Quantity production is desirable only when quantity is accompanied by **quality.**

DON'T CRIPPLE VALUABLE AGENCIES

No class of people in Florida, perhaps, are more in sympathy with the economy program of the state legislature than the citrus grove owners. However, few if any grove owners are prepared to support any suggestion that the work of the State Plant Board or the State Experiment Stations and the State Agricultural College be crippled by lack of funds.

No agencies in the state of Florida mean more to the citrus growers than the three above named, and any effort to curtail their efficiency through lack of funds will be resented by citrus growers in common with all others who have the welfare of Florida agriculture and horticulture at heart.

There are any number of extravagant, if not entirely useless, commissions and agencies supported by the state at the expense of the taxpayers, but the Plant Board, the Experiment Stations and the Agricultural College are not among them. These valuable agencies need more, not less, aid from the state.

CITRUS OUTLOOK

The California Citrograph carries a resume of the citrus outlook by H. R. Wellman and collaborators which gives anything but a cheerful note for California growers.

Viewing the situation from the standpoint of increased production in competing states and countries, the review sounds a warning that lower rather than higher prices must be expected.

If this outlook is based upon ascertained facts and sound reasoning, it becomes all the more important that Florida growers should pay greater attention to the **quailty** and **appearance** of their fruit. Quality and appearance are goverened by the physical condition of the trees. Healthy, vigorous trees can be maintained only by proper feeding and by keeping the trees free from pests and disease.

All of which points to the moral that it is cheaper to buy fertilizers and insecicides than to pay freight bills on fruit which fails to cover carrier charges.

The six-spotted mite is reported to be doing much damage in certain sections of the state. Grapefruit is particularly affected in some sections of the hill and lake region. Many trees are reported to have been practically defoliated before growers appreciated the extent of the injury. Lime-sulphur, applied immediately, is the accepted remedy.

A large orange crop but a lessened production of grapefruit is the early prediction of Florida citrus men who generally know their citrus.

The citrus grower who keeps posted on the best methods practiced by others, and who in addition knows his own grove, is the one who stands to make a profit one year with another.

STANDARDS OF MATURITY IN CITRUS FRUIT

(Continued from page 11.)

solids contents be provided in the standards, some as high as 9 point with a ratio of sugar to acid of 9 to 1. If such a law was passed it would prohibit the moving of such oranges as the Parson Brown, Norris, and Hamlin, until after the expiration of the green fruit law. The majority of the Florida Citrus Exchange Legislative Committee which was approved by the Board of Directors of the Florida Citrus Exchange that the present law with a ratio of sugar to acid of 8 to 1 was about as good as could be had until more complete data was gathered as to solids contents of the juice as well as the juice contents of oranges. It has been recommended to all associations in the Florida Citrus Exchange, that they keep aacurate tests on all oranges during the period of the green fruit law for the next two years, to ascertain what would be best to set up a standard of solids or juice contents in oranges. In making surveys in the various territories, oranges grown on sour stock carry high solids, while those grown on lemon root do not carry as high solids, but is as good an eating quality, if not better than those on sour stock.

Another matter before the committee was the question of keeping the shipper, operator or packer from packing and branding seedling oranges as Parson Brown. This practice has been going on for many years, due to the fact that the seedling oranges carry a fairly high ratio during the month of November in many sections of Florida, yet with a high solid contents in the orange test, we find many seedling sections that will not be able to move any seedlings until the law has been lifted. After considerable discussion and study the Composite Committee adopted the following on oranges, that is, an orange to be deemed mature for shipment must contain at least 8½ solids in the extracted juice and that the ratio of the juice should be 8 to 1 which is the same as the old law with the exception that we are placing a minimum solids of 8½. After giving this considerable consideration the speaker is still of the opinion that we should have more data on the solid contents of juice than we have, in order to establish a minimum solid for oranges and therefore believe that the present law is about as good as we can get to not cause any hardships or catastrophe to the orange industry for the coming two years.

Next, we take maturity on grapefruit, from our experience from the past two years we all realize that the grapefruit law must have some changes in order to provide a more satisfactory eating quality fruit. The past season has demonstrated to me that a juice contents must be provided for grapefruit, yet I do not believe it is the time to eliminate the acid test. I come from a section that has always shipped grapefruit early. Before there was any green fruit law, I had shipped grapefruit fully colored before the first of September, and as stated previously in this paper color of the rind spells maturity, under the law that is on our statutes today, relative to grapefruit, there is plenty of grapefruit that is fully colored that will not pass the required test and there is plenty of fruit which is dark green in color which takes from 72 to 90 hours in the coloring room which will pass the test as provided in the law. Now do you believe that our present grapefruit law is adequate under these conditions? Yet in establishing a law that is favorable to all sections and that will improve the quality with reference to maturity in our grapefruit it has been a big problem of the various committees that I have been on to set up a standard that will meet the requirements that will put good eatable fruit to the consumer, and last we must remember that

(Continued on page 22.)

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Satisfaction at Harvest Time

BLUE GOOSE NEWS

Monthly News of American Fruit Growers Inc. *Edited by The Growers Service Department*

VOLUME 5—NO. 6 ORLANDO, FLORIDA, MAY, 1931 PAGE 1

NEW YORK CITY GIVES BLUE GOOSE PREFERENCE

What New York City thinks of the Blue Goose trademark is quite adequately reflected in the preferences of the groceries, fruit and vegetable stands and delicatessan stores which supply New Yorkers with their fruit; and the trend of such dealers' favor is distinctly shown by a recent canvass made by dealer-service men under the direction of the advertising department of the American Fruit Growers Inc.

This canvass of four boroughs of New York City was made during December and January. It covered interviews with the owners or managers of 5,033 stores in Manhattan, Brooklyn, Bronx and Queens.

Of the 5,033 stores visited, only 135 stores, or less than eight per cent did not make a habit of carrying one or more items in the Blue Goose line. Just at the moment of the visit 4,132 of the stores called upon had one or more Blue Goose items in stock, and visible to the caller. Of these 94 per cent carried Blue Goose grapefruit, and 97 per cent had Blue Goose oranges in stock.

In the course of these service calls 29,930 pieces of Blue Goose store advertising in colors were actually put on display in these stores. In addition about 15,000 price tickets and other sales helps and reminders were distributed to store managers and clerks.

This canvass was supplementary to newspaper advertising which has run in New York steadily through this season. Supplemental to the newspaper advertising there has been a full showing of lithographed posters on oranges and grapefruit on subway and elevated platforms, which began on December 1 and continued through March, new posters being put up from time to time to replace those defaced or showing bad effects from exposure to the weather.

In transmitting report of this dealer's canvass, F. M. Lillie, advertising manager of the American Fruit Growers, Inc., rather pertinently asks: "Can anyone dodge the conclusion that Blue Goose means something in New York these days?"

DISTRICT OFFICE NOW OPEN IN WINTER HAVEN

For better and closer contact with the great producing sections of Polk and adjacent counties the American Fruit Growres Inc. has opened a district office at Winter Haven.

Bruce Floyd, with many years citrus shipping experience and likewise with a record of long service with the American Fruit Growers Inc. is in charge. He will at all times be in closest touch with Florida Division headquarters at Orlando, and thoroughly posted as to latest market developments.

Added contacts with growers which this arrangement will permit are expected to be of mutual advantage to the growers and to the organization.

J. S. CRUTCHFIELD UPON U. S. CHAMBER BOARD

J. S. Crutchfield, Pittsburgh, president of the American Fruit Growers Inc. was elected a member of the board of directors of the United States Chamber of Commerce at the opening session of the annual meeting of that organization recently at Atlantic City. Mr. Crutchfield will represent the department of Domestic Distribution.

During the past two years he has been vice-chairman of the chamber's Agricultural Service Department committee; and chairman of the Special Agricultural Committee, which was appointed to study on behalf of

(Continued on page 2.)

BROAD DEMAND WITH SMALLER SIZES WANTED

Despite the lack of anything exciting in the way of prices during the past month the markets of the country showed the ability to absorb a large volume of citrus fruits. As is normal toward the close of each shipping season there was a tendency to center demand upon the smaller sizes. Retailers all during the season have been emphasizing low prices to consumers. This adds to the usual demand for small sizes due to the desire for fruit which may be advertised at a low price per dozen.

Florida Valencias have fared well in the markets recently, the smaller sizes in desirable quality generally obtaining prices satisfactory to the growers. Navel oranges were sluggish but just prior to the clean-up of navels from California came the usual market upturn in prices, demand being stimulated by a certain amount of navels being put into storage.

California navel shipments promise to be cleaned up by the time these lines appear in print; and to the movement of Valencias from Northern and Central California will be added Southern California Valencia shipments. Early California Valencias shipments did not fare so well in competition with the full ripe navels; but are to be expected now to do better. Orderly movement of the remaining Florida Valencias however, should assure them a satisfactory reception.

In spite of strawberries coming in strongly the markets have taken Marsh seedless grapefruit in large volume; and indications are that the desirable sizes will continue to do well. Porto Rico has been shipping lightly, most of its output going for shipment abroad, where Florida recently has found difficulty in supplying the small sizes required.

Adv.

BLUE GOOSE NEWS

OFFICIAL publication of the American Fruit Growers Inc., Growers Service Department, published the first of each month in the interest of the citrus growers of the state of Florida.

EDITORIAL ROOMS
Sixth Floor, State Bank Bldg.
ORLANDO, FLORIDA

CULTIVATION

To cultivate or not to cultivate, and how much? That is the question.

Probably nowhere has such an intensive system of cultivation been in vogue as has been largely customary in citrus culture; and it is only comparatively recently that the attention of the more progressive growers has turned to questioining some of the established practices.

The theory that cultivation to form a loose mulch over the surface conserved moisture in the soil for the use of the trees has been rather thoroughly dissipated in recent years by conclusive experiments at several foremost experiment stations. With that idea exploded thought naturally turns to the question of just how much cultivation is really necessary and desirable.

Further experiments have established that those who would go to the other extreme and cease cultivation entirely cannot expect to hold the pace in the point of production. Weed growths, it has been ascertained, increase the evaporation of moisture from the soil to an almost unbelievable extent in dry weather. For this and other reasons commercial citrus culture without cultivation cannot be anticipated.

Cultivation, or soil tillage, is an expensive factor in fruit production. A program which will reduce cultivation costs to a minimum, and yet provide all the soil-stirring which his grove actually requires is self-evidently most desirable for each grower. Soil types, locations, fertilization practices and other things will enter into the problem of determining just what amount of cultivation constitutes the best practice in individual groves. Consideration must be given to both quantity and quality of production.

At a recent gathering of California growers one grower reported he had been able to reduce his cultivation costs twelve dollars per acre annually, and at the same time had obtained an average of over one hundred boxes per acre in increased yield of good quality fruit of desirable size by striking just the proper balance of cultivation. Results of this nature demonstrate the importance of proper cultivation practice.

Florida growers are giving much attention to the subject; and there are plentiful indications that we are due to make large progress in the direction of ascertaining how much cultivation is needful for the best citrus culture; and how much unnecessary cultivation expense may be eliminated.

Adv.

CONTINUE TO CHARGE FOR NON-ICED FREEZERS

Disputing the contention of Florida shippers that a recent decision of the Interstate Commerce Commissions upon refrigeration charges, in which the Commission held that the line- haul freight rates from Florida included all costs to the carriers of furnishing refrigerator equipment for the citrus crop movement, was to be interpreted as cancelling the charge being made for furnishing non-iced refrigerator cars for citrus movement, the carriers serving Florida have given notice of the intention to continue to make this charge.

Considering the language of the decision in question, the traffic department of the American Fruit Growers Inc. is emphatically of the opinion that this charge ranging from five to eleven dollars per car should be terminated; and this opinion is shared by other Florida citrus traffic men. However, due to the absence of J. Curtis Robinson of the Growers and Shippers League of Florida, who is just now in Washington appearing before the Commission upon another matter, it has not at this time been determined whether or not it may be possible to obtain from the Commission a ruling which will clarify its intention in the decision handed down, or it may be necessary to file a new case with the Commission to ask for the removal of these charges for the use of non-iced refrigerator cars.

J. S. CRUTCHFIELD UPON U. S. CHAMBER BOARD

(Continued from page 1.)

the chamber the farm relief legislation then pending. By virtue of his selection, he will be considered the representative of agriculture on the board of the chamber.

Mr. Crutchfield's candidacy for election to the board was actively sponsored by the American Fruit and Vegetable Shippers Association, and in addition was endorsed and supported by the International Apple Association, the National League of Commission Merchants, the Western Fruit Jobbers Association, the Pittsburgh Chamber of Commerce, and a considerable number of other chambers of commerce and various trade associations.

As vice-president of the American Fruit and Vegetable Shippers Association he is in constant and close touch with the problems of the fresh fruit and vegetable industry in all sections of the country and in an unusually advantageous position to transmit the thoughts and sentiments of this vast industry.

BLUE GOOSE TEAM WINS ON DIAMOND-BALL FIELD

The Maitland packing house of the American Fruit Growers Inc. this season has a diamond-ball team in the field which upholds the prestige of the Blue Goose trademark most capably.

In a number of engagments with the best teams in the Orlando area the Maitland Blue Goose team has made consistent winnings; and has taken into camp some diamond-ball aggregations that were believed to be unbeatable.

Composed entirely of Maitland employees of the AFG, the team is the pride of Manager Paul Rogers of the Maitland house, and of the growers in that section of Orange County.

Because it is operated by humans, it cannot be perfect; but AFG Selling Service represents the sincere effort of the largest corps of expert men selling fruits and vegetables.

SUMMER GRAPEFRUIT GETS GREATER PRICE

During the eight months from October to May inclusive the bulk of the grapefruit crops of Florida, Texas, Arizona, and the Imperial Valley and Central sections of California comes upon the markets.

In California most of the increase in bearing acreage in grapefruit has been in the Imperial Valley in recent years, according to H. R. Wellman, in collaboration with Messrs. Braun, Shear and Voorhies of the University of California in study of the grapefruit situation for the Giannini Foundation of Agricultural Economics. In 1925 there were only 500 acres of grapefruit in bearing in Imperial County; in 1929 there were 4,680 acres in bearing, with 3,600 additional acres not yet in bearing.

In Arizona the bearing acreage of grapefruit increased from 560 acres in 1924 to 1,640 acres in 1929, with an additional 2,900 acres not yet bearing, according to these same authorities.

The expansion of grapefruit acreage in the Rio Grande Valley of Texas is termed "phenomenal." The total grapefruit acreage there in 1930 is given as 60,000 acres, and only 10,200 acres, or 17 percent, of the trees five years of age or older. The 1930 freeze in this section is credited with having nipped back many of the younger trees but the setback is regarded as only temporary.

Crediting Florida with 80,000 acres of grapefruit mostly in bearing, it is pointed out that the increasing age and size of the trees is increasing production at the rate of about five per cent yearly; and that production is due to increase thus for several years.

During the past ten years there has been a very substantial increase in the consumer demand for winter grapefruit, the survey points out; and it is anticipated that "a further increase in demand both in this country and in Europe can reasonably be expected."

Crediting Florida and Porto Rico with having supplied the bulk of the grapefruit sent to European markets thus far, the possibilities of future competition from Palestine, the West Indies, Brazil and South Africa in foreign markets is cited, as the grapefruit acreage in these producing sections may be due to increase.

Growth of the grapefruit canning industry in Florida from its recent small beginning to its present large proportions is reviewed, with the statement that "present indications are that canning will continue to provide an increasing outlet for grapefruit." The researchers, however, express belief that the canned product to an extent competes with the fresh fruit in the markets.

Pointing out that in recent years there have been practically no plantings of grapefruit in sections which ship during the summer months, and that most of the summer producing acreage is now in full bearing, it is assumed that supplies of fresh summer grapefruit are not likely to increase materially for some time. The demand for summer grapefruit meantime has increased rapidly. During the three years from 1922-23 to 1924-25 inclusive, it is pointed out, f. o. b. prices for summer grapefruit averaged only twenty cents per box higher than those realized for winter grapefruit whereas during the past three years they have averaged eighty-five cents per box higher.

Figures for the present shipping season are not included in the survey, and there is no anticipation of the possible effect of the large volume of Florida grapefruit canned during this season which will be available for consumption between now and next autumn. There is every evidence of painstaking care in the survey; and the researchers have brought to light much that is of great interest to grapefruit growers.

Experienced growers are inclined to give full consideration to accurate figures upon bearing acreage; but the inevitable mortality to many plantings of citrus trees is responsible for a tendency to discount figures upon non-bearing acreage in any citrus survey.

"Selling is . . . in itself a highly specialized business . . . no longer do men cobble a bit then peddle a bit . . . intelligent selling can keep a whole building full of cobblers busy at the business they know best . . . cobbler and salesman profit the more for their specializing."
A. M. Duke

Every grower served by the American Fruit Growers Inc. knows promptly what his particular fruit brings in the market, and where, and why.

Why is the Blue Goose trademark so well and widely known? Because of intelligent advertising, and the fact that the Blue Goose is so easy to visualize and remember.

Adv.

A THOUSAND MARKETS

With sales connections in over two hundred central carlot markets in the United States and abroad, the American Fruit Growers Inc. opens literally a thousand markets to each grower it serves for the disposal of his products to the best possible advantage.

This, the widest flung sales organization of any serving producers of fresh fruits and vegetables, is likewise the livest and most alert.

Fifty-two weeks in every year it is busy serving the produce trade, contacting the buyers, rendering material aid in supplying their requirements. Blue Goose Fruits and vegetables are in season every day of the year.

In every carlot market the Blue Goose Men outstanding figures, leaders, confident and commanding confidence. And, in consequence, in a position to render exceptional service to those growers whose products they present for sale.

Aided, too, by an established and recognized consumer demand, which maintains the flow of a vast volume of fresh fruits and vegetables from all quarters of the United States to the dining table of the nation, and to places abroad where incomes permit sharing American standards of living.

It is an exceptional selling service, operating effectively for the better distribution of fresh fruits and vegetables.

AMERICAN FRUIT GROWERS INC.

FLORIDA DIVISION

ORLANDO, FLORIDA

Adv.

CITRUS COMMENTS

—BY—

Charles D. Kime, Orlando, Florida

This department is devoted to furthering horticultural interests of Florida. Letters of inquiry, discussion or criticism will be welcomed

Summer Fertilizing

During the past winter the Florida citrus growers have had very similar weather conditions as occured during the years 1929 and 1930. That is, the weather has been continuously wet and cold. The groves on the whole have come through the conditions of the winter just past in very good shape, but not quite as good as the winter previous. That is, it is easier to find groves more starved in appearance than was the case at this time last year. It may be that the precipitation records offer some explanation as, though when the weather has been abnormally wet, the precipitation on the whole has been less than was the case a year ago throughout the Central Sections.

As occured last year, the trees bloomed very heavily and have tended to set a heavy crop which is holding on well and shows excellent color to date. The average grove, during the past Spring, has received a mixed fertilizer, but we have the condition of straight materials being used more extensively than at any time in the past.

The results in both grove condition and fruit crop from now on will largely depend on weather conditions. Last year was continuously wet and the precipitation was sufficient with a minimum of fertilizer. If the present season is continuously wet there will undoubtedly be sufficient fertilizer reserve in the soil to carry the groves through in a similar way as occured last year, but if, as present conditions indicate, precipitation will be considerably less, grove results will depend almost entirely on the summer application of fertilizer with only a very small proportion of our results being due to summer rains.

There is apparently some value in continued rain even with very light applications of fertilizer. Groves seem to be able to maintain good conditions where they have sufficient moisture even though they have been slighted on the amount of plant food the owner has supplied. There would be, however, a limit to the reserves which the weather would make available and the indications are that we are approaching that limit. In other words, the wise grower will supply ample food reserves which would make up for deficencies which have occured in the past and to make up the soil reserves for deficiencies which have been drawn on during the wet weather.

Dry weather continued for a very limited time is likely to turn our groves yellow and cause them to shed the newly set fruit in huge quantities. Wet weather without supplying a sufficient fertilizer reserve can only partially overcome this condition. It would seem that the summer application of fertilizer is therefore very important—first, in maintaining the trees in good condition; second, in enabling them to hold their present crop; and third, in helping to rebuild their soil reserve.

Generally during the summer Florida has had a comparatively heavy precipitation. In other words, we have always been able to rely on our summer showers. Therefore our choice is limited to those materials which are less quickly available if we would obtain an even feeding, especially of the nitrogen supply. Further than this, the summer application gives us the opportunity to balance up deficiencnes in the Spring application in the soil condition and gives us the opportunity of improving tree conditions, but what is of more importance is that we begin with the summer application to determine the fruit quality which the grove will produce the following winter. The most important factor is the fruit quality factor and it is the thing about which we hear the least until the fruit is packed for shipment and is going through the packing houses. The statement is often made that we will get good fruit quality if we can get good physical condition of the trees. This is not true at all as many of us know to our sorrow when we receive returns from our fruit sold during the past winter. It often happens that the best fruit quality comes from trees in poor condition. In other words, the things that make for fruit quality do not always make for good physi-

(Continued on page 24)

GOING TO TYBEE OR JACKSONVILLE BEACH?

Stop At

HOTEL SAVANNAH

Savannah, Georgia

—and—

HOTEL SEMINOLE

Jacksonville, Florida

Modern —: Fireproof

RATES: Without Bath, $1.50 Up — With Bath $2.50 Up

IN EVERY ROOM

Radio—Loud Speaker — Rates Posted On Door

Electric Ceiling Fan — Soft Water

MOST CENTRAL LOCATIONS

CHAS. B. GRINER, Manager

IMPRESSIONS

By the Impressionist

And down near Lily, which we are accustomed to think of as J. Ed. Raulerson's town, the late N. C. Platt, so a writer says, once planted orange trees in between the Indian raids. Much in the same manner, we presume that we now plant peanuts in between the Indian corn.

Gus Hall, the experienced and very efficient manager of the South Lake Apopka Citrus Growers Association at Tildenville, works a wrinkle which appeals to us. With the distribution of pool proceeds each grower receives a mimeographed sheet, which shows in detail precisely what fruit each grower had in the pool, quality, sizes, etc., and the average price each grower obtained. It not only builds confidence upon the part of the participating growers, but clearly demonstrates what part sizes and quality played in the marketing. On the sheets the various growers are indicated by numbers, which we imagine somewhat softens the blow of the publicity to those whose fruit did not possess the most desirable market qualities.

The appearance of Col. Raymond Robins upon the stump for the Florida Citrus Exchange in its membership campaign in some quarters raised the mental question of just what political office he was being prepared to run for. Justification for this somewhat skeptical attitude is found in certain past experiences. However, in his Orlando speech Col. Robins thoroughly exploded such possibility by the outright statement that for voting purposes he retained his legal residence in Illinois.

Fine man, this Colonel Robins. Once, while we were working in Chicago, we voted for him. He didn't get elected; but that was neither his fault nor ours. We consider him one of our very finest national figures; and a splendid gentleman. But we grinned when we read how after being a Democratic figure, he had joined his brother-in-law Theodore Roosevelt (but the Exchange booster folder didn't mention the relationship with Theodore) on the Bull Moose ticket. Then the folder stopped short. It didn't say a word concerning how when Teddy returned to the stalwart G. O. P. ranks that ol. Robins went with him; and how he ranks among the Republican national leaders, and principal national campaign contributors. Why not?

We, being a Democrat, rather naturally feel that Democrats grow better fruit; but we are forced to admit that the oranges our Republican friends grow do not, as a matter of fact, turn sour on the trees.

Now, there is Judge William Hunter of Tampa, general counsel for the Exchange since its inception, one of the most highly respected members of the Florida bar, a constitutional lawyer of note, a resident of Tampa for the past 108 years, and—a lifelong Republican, even though he doesn't work so hard at that trade.

Homer Needles, over at Fort Pierce grower, director of the Exchange, and prominent East Coast figure, is said to feel he simply isn't voting if he cannot locate a picture of an elephant on the ballot.

Judge Allen E. Walker, Winter Haven grower, first president of the Florida Citrus Growers Clearing House Association, it is said, even will not eat carrots, because to his highly sensitive Republican-consciouness carrots and the Democratic jackass are associated ideas.

Nor are all inside the Exchange. For instance, Fred E. Godfrey, well known Orlando independent shipper, past president of the Fruitman's club schoolmate of Calvin Coolidge, president of the Young Men's Republican Marching Club of Pinecastle.

A lot of others; and we shan't attempt to catalog them. For we are getting aside from the point. The old Florida Republican "organization" has reason to know of Raymond Robins' status among the big boys of the party. We might tell an interesting story of a postmaster in a Florida town, appointed by Woodrow Wilson, to whom Col. Robins took a liking. When his term was up the "organization" recommended to the then Republican adminstration another man. Col. Robins single-handedly recommended his reappointment. Quite a bit of fuss over a small matter; but when action came, he was reappointed.

And contrary to expectations, the project of moving the Excange headquarters, hasn't died out up to the time these lines are written. To the surprise of many the Federal Farm Board accepted the responsibility of deciding the matter of the location of Exchange headquarters, stipulating, however, that its findings when rendered must be binding upon the cooperative. Representaives of the Farm Board have been in Florida making surveys; and who knows what will happen next?

The Supreme Court has ruled that a man may mortgage the crop of fruit on his trees without need for his wife's signature to the document. More of an appurtenance than hereditament, so to speak.

(Continued on page 26.)

CITRUS NURSERY NEWS

We have for sale 200,000 Orange and Grapefruit trees of staple varieties on sour orange roots. Caliper ½ to 3½ inches. Fine stock. Must be sold. Write to us for prices.

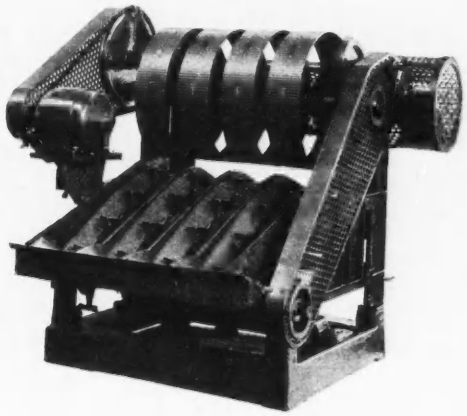
Lake Nursery Company

Leesburg, Florida.

SÉVIGNÉ

FRUIT STAMPING MACHINE

1931 MODEL E THE GREATER CAPACITY MACHINE



Designed and built to handle Oranges, Grapefruit and Tangerines. Adjustable without the use of tools.

A fruit stamping machine with performance ability far in advance of any other type, and destined to build up new conceptions of reliability, speed, flexibility and stamping results. THE FASTEST FRUIT STAMPING MACHINE ON THE MARKET. A tremendous increase in speed and flexibility—one machine accomplishing the results of two or more machines heretofore necessary. All major motions are rotary. There are no jerky, reciprocating movements—practically noiseless.

THE SEVIGNE MACHINE takes on and discharges fruit on the same level, assuring quick and easy installation, and requires no electricity to heat stamping dies. Operates by ¼ HP motor, 4-speed V-Belt Drive. Provision for by-passing and multiple dies.

Bronze-bushed throughout, chrome nickel-steel shafts, a liberal use of bronze and aluminum, oilless bushings, ball bearings, Zerk-Alemite lubrication, and uses a color inking ribbon insuring permanency of trademark on the fruit whether brogdexed, oiled or wet surfaced. It has the endorsement of many of the largest shippers of citrus fruit. Demands create new ideas and new machines. THE SEVIGNE GREATER CAPACITY MODEL E COMBINATION TYPE MACHINE excels in efficiency, simplicity, long life and speed.

Don't handicap your 1931 Sales by neglecting to identify your fruit. Everyone realizes the importance of advertising, but advertising will never pay unless the produce advertised can be readily identified by the consumer and readily connected with the advertising. Ordinarily when your product reaches the consumer it has been stripped of the tissue wrapper, and there is no way to identify it. The thought persists that the demand for oranges and grapefruit must be expanded, and only the stamping of the fruit can bring about the results desired.

PRICES:—$1200 for the four run, $1500 for the six run, $1800 for the eight run machine completely equipped with motor and dies. (f. o. b. Nashua). PLACE YOUR ORDERS NOW.

F. J. Sevigne Machine Co., Nashua, N. H.

STANDARDS OF MATURITY IN CITRUS FRUIT

(Continued from page 14.)

the consumer is the judge in the maturity of our fruit.

Taking all facts and data that the Legislative Committee of the Florida Citrus Exchange could collect and had before them, the following standards were established by this committee:

You will notice that the juice contents approved by this committee was that recommended by Commissioner Mayo and his staff. Probably juice contents may be low and could be increased 25 to 30 cubic centimeters to each size grapefruit, yet we find that this will eliminate sections like the Homestead section, due to the Royal variety grapefruit which has always been shipped from this section early, and is a good eating fruit, but due to the thickness of its rind would not meet an increased juice requirements while many other sections had thin rind, full of juice, carrying full color did not meet the required solid contents which is provided in the present law or recommended by others, therefore it was the opinion of the committee that the minimum solids in grapefruit should be reduced to 8 and that the ratio on fruit between 8 and 9 in minimum solids to be deemed mature must have a sugar to acid of not less than 6½ to 1, providing that it carried the juice contents proportionate to its size. The recommendations of this committee were passed on to the Composite Committee and were approved by them without any changes. It is my opinion that this is about as good a set up as we can work out harmoniously in consideration of all sections and should put a far better eating grapefruit to the consumer than we have been able to do in the past.

I want to say further that Mr. Mayo and his staff have cooperated 100% with the Committee in trying to work out a solution for the best interests of the industry, particularly the grower and the consumer, as Mr. Mayo has expressed himself, that the consumer must be satisfied before the grower can realize any profits on his investments.

Now on all the Committees with which I have had the pleasure of working, it was the object not to shorten the shipping season of our citrus fruit, but to try and establish standards that would allow good eatable fruit to move when it was ready so that we could always have satisfied consumers. I have heard it expressed a number of times that no complaint was made as to oranges, but I disagree on this, for I have seen oranges on the market that were so far from eatable that the retailer had to discard them, and they were not processed oranges either. In talking with our tourists this winter as many complaints were registered against immature oranges as were against immature and ricy grapefruit, yet I want to again repeat that further data must be obtained as to the question of maturity of oranges than we have at hand at the present time.

In all the world there is no argument so effective as quality.

WHEN YOU BUY Niagara YOU BUY PROTECTION

You Can Depend On EMULSO

Either in the old familiar liquid form or the newer concentrated jelly (E m u l s o Concentrate) Emulso can be relied upon to effectively and safely clean up scale and white fly.

No extravagent claims were ever made for Emulso. All recommendations are conservative and based on average conditions. Under certain conditions, Emulso will do much more than is claimed for it, but your pest control program should not be based on unusual results one or two times. It takes several seasons to prove the true value of any insecticide, especially oil sprays.

NIAGARA SPRAYER & CHEMICAL CO. INC.,

Jacksonville, Florida.

THE MARKET... ACID TEST *of* YOUR CROP'S WORTH

This is the seventh of a series of Armour advertisements discussing the following phases of the citrus industry:

1. **Importance of the citrus industry to Florida.**
2. **Nursery stock and young groves.**
3. **Bearing groves and varieties of fruit.**
4. **Harvesting.**
5. **Packing.**
6. **Shipping.**
7. **Marketing.**
8. **Advertising.**
9. **Citrus by-products.**
10. **Salute to the industry.**

NO MATTER how you sell your fruit, the price it brings is the final test of its value. Whether you sell the crop through marketing agencies, cooperative organizations or by other means, the chief feature of the marketing so far as you are concerned is the price paid for it.

Fruit in the market must stand on its own merits. Quality commands the best figure. By controlling the quality of your fruit you are exercising the only control you have over it after it gets to market.

Quality! That is the magic element that makes the bids ring out when the auctioneer begins his work. It is the selling force that makes the fruit dealer burnish and polish quality stock to catch the housewife's eye and compel her to buy.

Quality is the force that operates from the consumer through the chain of marketing, shipping and packing to you. And, of course, quality is strictly up to you as the producer. You can have quality fruit if you will.

The price your fruit brings in the market has a direct relation to the quality and quantity of fertilizer you use in growing the crop. **Quality fertilizers produce quality crops.** Armour's BIG CROP Fertilizers are made with this fact in view. Though they cost no more than other high grade fertilizers BIG CROP brands are made scientifically in accordance with result-proved formulas backed by the skill and knowledge of a far-flung organization that has devoted many years to the study of proper fertilizing methods for citrus, truck and field crops of all kinds. For quality use Armour's BIG CROP Fertilizers.

MAIL THIS COUPON TODAY

ARMOUR FERTILIZER WORKS,
Dept. 146, Jacksonville, Florida.

Please send me, free, a copy of your "CITRUS FERTILIZING IN FLORIDA" booklet.

Name _____

P.O. _____ R.F.D. Route _____

County _____ State _____

Dealer's Name _____

Free Booklet

Armour's

BIG CROP FERTILIZERS

Our Florida warehouses are located at
Winter Garden, Orlando, Homestead, Fort Myers,
Frostproof Lake Wales, Arcadia and Palmetto

CITRUS COMMENTS

(Continued from page 19)

cal condition. Therefore, maintaining a tree in good physical condition is not necessarily producing a high quality fruit, often the reverse is the case.

For the above reason it pays any of us to select our summer applications very carefully and if necessary to split application, applying at the present time one part and the balance later in the season. It pays us to do this because growing a fruit is a separate and distinct proposition from growing a tree, and the condition of it should be the prime motive.

About as far as we have been able to go on a large commercial scale at present is the supplying of ample reserves of potash and phosphorous. We are also finding that other materials are of value in this respect and we therefore advocate the use of so-called impurities directly as a part of the fertilizer, or indirectly as a separate application. We find that chlorine and potassium chloride (muriate) and that magnesium in sulphate of potash-magnesium and that soda and suphur and a number of other materials are of value as factors. The use of these materials is not necessary all at one time, but the best results are secured by varying the sources of plant food which are supplied. The main reason for calling attention to them at this time is that the use of so-called impurities is okay, but that at the same time the principal element for producing smooth skin and good quality is potash.

A little inquiry upon the part of any one among the older packing house managers brings to light the fact that as a result of an ample supply of potash they feel that their fruit carries better and that it holds up better on the market after arrival and that it always has a much superier quality.

In brief, a summary of the summer fertilizing requirement would be supplying such nitrogen to carry the grove through until Fall, but by all means be sure to supply along it ample sources of potash to balance up the fruit crop and secure good quality.

Sprays and Dusts Recommended Freely for Use in Other Sections

The 1931 peach schedule in Georgia, as released by the peach insect laboratory of the U. S. Department of Agriculture, calls for three sprays on early varieties and four sprays for other varieties. The first calls for one pound lead arsenate plus milk of lime made from three pounds of stone lime and fifty gallons of water applied when the pink petals of the flower are about 75% off. The second spray is a repitition of the first and is applied as the caleces or shucks are shedding off the small swelling fruit. Two weeks after this or about four weeks after the petals have shed a self-boiled lime sulphur 8-8-50 is used alone (no lead arsenate). The fourth application, four weeks before ripening of the variety, consists of one pound of lead arsenate mixed to each 8-8-50 of the self-boiled lime sulphur solution used in the third spray.

Dusts are not recommended in place of spraying and are not considered as effective. The dusts used are lead arsenate and lime 5-95% for the first two applications. The third and fourth applications consist of dusting sulphur 80%, lead arsenate 5% and lime 15%.

According to this schedule it is more trouble to raise good peaches than to produce bright fruit.

From Louisiana we learn that satsumas must have bordeaux oil for best results and that this spray must be repeated about the same as with our grapefruit. In addition bordeaux and arsenate of lead (3-3-50 and two pounds of lead arsenate) is recommended for two later applications if necessary, and lime-sulphur is recommended if red spiders become bad, to be follwed later with an oil-emulsion if scale becomes bad. This procedure is as complicated as our citrus spray schedule.

Sugar Cane Will Not Grow Without Potassium

Much of everglades soils will support economic crops successfully when supplied with manganese-sulphate and bluestone. It has not been clearly established whether this is an actual soil deficiency or if the process of working in manganese-sulphate causes a train of soil reactions through which other materials are made available and therefore utilized by the plant.

In this connection it is of interest to note that Dr. Constance Hartt of St. Lawrence University of Canton, N. Y., clearly established a definite need of potassium by sugar cane. Deprived of potassium he found that the plants did not grow freely and even died back and were very deficient in green coloring matter. With increased applications of potassium increased growth was secured and a rather definite correlation was established between growth and quantity applied.

Here is a statement regarding fruit trees in the North that is just as applicable to Florida:

"There is considerable misunderstanding as to the relative rate of availability of different sources of nitrogen to fruit trees according to V. A. Tidgens, research fellow at the New Jersey Experiment Station."

Mr. Tidgens worked with a block of peach trees during July that had already stopped growth, the leaves were yellowish-green and badly infected with bacterial leaf spot. There was some question if any response could be secured at that late date and the bad condition of the trees considered.

The soil was sandy, very dry, and acid raw pH 4-2.

Nitrate of soda, sulphate of ammonia, calcium nitrate and ammonium nitrate were dissolved at the rate of five pounds to fourteen quarts of water, and these materials were sprinkled separately around different trees. There was hardly sufficient water to wet the surface.

Five days passed before rain fell. Eleven days following the application the treated trees exhibited signs of improvement. Green color increased over the check trees which were still yellow. On August 2nd, two weeks after the application, nitrates were found regradless of the source of nitrogen, in tree tissues.

From the appearance of the trees the difference in intake of the ammonium and nitrate salts was a question of hours and not days.

Greenhouse checks showed a similar result.

From the above results and some ad-

SUMMER CONTROL OF
CITRUS PESTS
For best results against Scale, Rust Mite & White Fly, spray your trees with VOLCK or KLEENUP...the proven Oil Sprays for citrus work.
Write for Spray Bulletin
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SCIENTIFIC PEST CONTROL

ditional work Mr. Tidgens felt that some absorption of ammonia occured directly and before any conversion took place. The question of availability seemed to depend more on the soil pH reaction and the moisture content rather than the source of the nitrogen.

Again it seems very curious to compare the similarity of such results as these to the responses we get in citrus work, though it seems reasonable to expect similar absortive ability between most of our fruiting trees

---

Pollinization experiments continue to attract the attention of many fruit growers.

Excepting valencias and navels there is no reason to assume that cross-pollinization will improve set or yield of fruit. All of our early fruit and midseason fruit including all grapefruit, tangerine and king oranges are self pollinated. They do not set any heavier so far as can be observed following any attempts at cross- pollinization.

Valencias and navels are probably in this same class; their lack of setting heavy crops even when blooming freely being due to entirely different reasons. For example, both of these varieties will mature a fruit with no pollen whatever being allowed to come in contact with the pistil of the blossom.

This ability of self-fruiting, without pollinization occuring from the same blossom or pollen being carried over from some other blossoms, is one of the most interesting phases of fruit production. It is not at all uncommon among tropical fruits.

As citrus production increases export restrictions are made more severe.

The Foreign Agricultural Service of the Bureau of Agricultural Economics make some interesting statements, World-wide production has increased to the point where many foreign countries are passing legislation looking to an improvement of the export pack. Such regulations have recently been put into effect by Spain, Palestine, Argentina, Brazil, and Italy.

The United States and other countries are all planning increased export movement to the same countries. This increases selling competition. The United States alone has an increase in production from 21,400,000 boxes average five years ago to 38,400,000 the last five years up to 1930. The increase will run over 50,000,000 boxes within a year or two. The grapefruit crop is already running 15,000,000 boxes and increasing very rapidly.

Competition comes mostly from the Southern Hemisphere and therefore in oranges covers the period May to November which is the California valencia period. Spain is improving export pack and is Florida's main competitor as its season and ours correspond.

Grapefruit production is also increasing in the same countries producing oranges, but on a much smaller scale. For some time to come Texas will remain Florida's strongest competitor.

BRITISH CONSUMPTION OF FRUIT JUICES INCREASING

Despite various adverse factors, the consumption of fruit juices is increasing in Great Britain, according to a report from American Trade Commissioner James Somerville which has just been made public by the Commerce Department. The total fruit-juice consumption by the British, it is pointed out, now amounts to 1,650,000 gallons annually, the bulk of this being in bottled form. The United States is the fourth largest supplier of fruit juices to the United Kingdom.

Citrus fruit beverages, according to Somerville, are regarded by the British as essentially hot weather drinks, but recently a movement has been started to educate the public to the health value of these beverages for year-round use.

One outstanding factor which has tended to limit the consumption of fruit juices in Great Britain has been the slow growth of the soda fountain.

Lemon juice forms the basis of the most popular fruit drinks in the United Kingdom. Imports of lime juice are about the same as those of lemon juice, but much of this commodity is reexported or used in making other products. Orange juice ranks next in popularity and there appears to be a growing market for pure grapefruit juice. Until recently, according to the report, there has been a very noticeable preference for concentrates of citrus fruit juices, or for fruit juice made in Great Britain of imported fruit. At the present time, however, the trend is toward pure juice from tree-ripened fruit.

Small orders or large receive prompt, careful attention

THE MOST FOR YOUR DOLLARS

FERTILIZER is the MOST NECESSARY and largest expense you have. Don't take chances—buy a time-tried PROVEN brand. A. & G. FERTILIZERS completely fill the bill for healthy trees and fruit. No fillers—A. & G. is uniformly mixed. Our Research Department will gladly help you solve any soil problems. Write for Free Price List No. 64.

AMMO-PO

The original, natural product, 18% Ammonia in form of Nitrate of Soda and 13% potash in form of Potash Nitrate. Finely ground for easy distribution . . . packed in water-proof bags . . . absolutely free of Borax and Chlorine.

ATLANTIC & GULF FERTILIZER CO.

C. NASH REID, President

Jacksonville - - Florida

An A. & G. Mixture to suit every soil requirement

IMPRESSIONS

(Continued from page 20.)

And W. H. is "Grandpa" Bill Mouser now.

A. R. Sandlin, the well known Leesburg grower, for the past couple of years salesmanager of the Texas Citrus Fruit Growers Exchange, back in Florida for a short trip, showing P. Gianakopulos of the well known firm of C. H. Weaver & Co., Chicago, about the state. Returning to Texas, but due back here in June to spend the summer.

Three separate and distinct citrus cooperative shipping organizations in Texas; and the Federal Farm Board has made no headway whatever in trying to bring them together.

Another prominent figure gone from our citrus world. J. A. Caldwell of Lake Wales, long manager of the Highland Crate Co. of Avon Park, particularly well known in Exchange circles, died suddenly in the Lake Wales hospital. A former Wall Street broker who made good in the pine woods.

CITRUS INDUSTRY Advertising pays big dividends to its users.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of August 24 1912, of The Citrus Industry, Published monthly at Tampa, Florida, for April 1, 1931.

State of Florida.
County of Hillsborough.

Before me, a Notary Public, in and for the state and county aforesaid, personally appeared S. L. Frisbie, who, having been duly sworn according to law, deposes and says that he is the editor of The Citrus Industry, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc. of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 433 Postal Laws and Regulations, printed on the reverse side of this form, towit:

1—That the names and addresses of the publisher, editor, managing editor, and business manager are:

Editor, S. L. Frisbie, Tampa, Fla.

Business Manager, S. L. Frisbie Tampa, Fla.

2—That the owners are:

Associated Publications Corporation, Tampa, Florida.

S. L. Frisbie, Tampa, Fla.

S. Lloyd Frisbie, Tampa, Fla.

B. L. Gable, Lutz, Fla.

F. L. Skelly, Orlando, Fla.

Frank Kay Anderson, Altamonte Springs, Fla.

R. W. Skinner, Dunedin Fla.

F. P. Wall, Mansfield, Ohio.

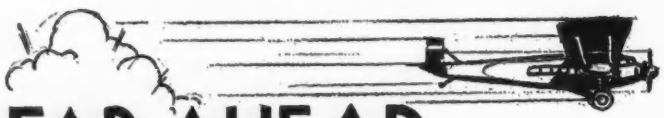
3—That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are:

Bankers Mortgage Co., Orlando, Fla.

Sworn to and subscribed before me this 14th day of April, 1931.

HARRY E. KLEIN,
Notary Public.

DUSTER. Niagara. Air-cooled engine. Steel truck-mounted. Nearly new. Samuel Kidder, Monticello, Florida.



FAR AHEAD OF THE FIELD

15 Different Analyses can now be obtained in this Famous Formula

SO ASTOUNDING have been the results shown by PERUVIANITE since its introduction to the Growers of this state, that its manufacturers are now presenting this remarkable formula in a series of 15 different analyses.

In selecting an analysis in the PERUVIANITE formula, you have your choice in Ammonia content of either, 4, 6 or 9% with the Phosphoric Acid running from 3 to 12% and with the Potash from 6 to 12% - - - an analysis to meet the plant food requirements of any crop grown in Florida.

PERUVIANITE can be copied as to its analysis, but the PERUVIANITE formula can be made only by this company - - - it's the combination of NitraPo and Genuine Peruvian Guano in the PERUVIANITE formula that puts it far ahead of any fertilizer now being offered in this state.

NITRATE AGENCIES

NACO BRAND

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COMPANY

JACKSONVILLE FLORIDA

NITROGEN

is the most essential element used in the fertilization of crops grown in Florida. PERUVANITE gets its Ammonia from Genuine Peruvian Guano, most available of all organics and from NitraPo . . . a combination that gives you both quick-acting and slow-acting Ammonia. There can be no better combination.

Combining its Nitrogen with varying quantities of A.P.A. and Potash, this balanced, high organic PERUVANITE formula will keep the trees vigorous and healthy and aid in maturing well-shaped, fine textured fruit.

ASK US to have our representative call on you and prescribe for the Summer needs of your grove . . . their recommendations have proven of great value to Citrus Growers.

APHIS, ONE OF THE MOST INTERESTING OF INSECTS

Almost everyone is familiar with the Aphis which is found in such profusion on almost all kinds of plants and shrubs in what is called an "Aphis year". Some years the Aphis does not bother to any great extent because conditions are adverse to its growth. When conditions are favorable, however, Aphis seems to develop almost over night to an extent which is highly detrimental to flowers, shrubs, gardens and other plant life.

The Aphis comes through the winter in the egg stage. With the coming of spring these eggs hatch, the young being 100% females and are called stem mothers. These stem mothers establish themselves on the tips of twigs and immediately begin producing young in great quantities. These in turn are all females and multiplication is continued at a rapid rate, the result being in favorable weather that the tips of the branches on the trees and shrubs are often actually weighed down by the volume. By some curious twist in nature a brood of Ahpis bearing wings is produced as soon as the quarters get too crowded in a particular locality. This winged brood establishes itself in new quarters and continues producing more and larger families.

Cool, moist weather is favorable to Aphis and if Spring comes off with that type of weather predominating, Aphis is soon seen in abundance all over the place. At such times spray made of "Black Leaf 40", one teaspoonful to a gallon of water to which has been added a small piece of soap, used on the Aphis immediately destroys them by the millions, however, there are always a few left in a "good Aphis year", and successive sprayings will be required to keep the swarm at a minimum.

The years 1927 and 1929 were "Aphis years" in the territory east of the Rocky Mountains. After midsummer Aphis is not of particular importance as a pest. The damage has been done and the individual left over to lay the eggs in the fall are hidden away and not ordinarily noticed on the tree or shrub.

The Aphis is a great enemy to the fruit grower because of its activity in the early season. The species known as rosy Aphis is busy at work at the time the tiny fruit is making its appearance in the blossom. The Aphis draws its sustenance through

(Continued on Page 34)

IT'S MARKETABLE FRUIT THAT COUNTS

IN view of the present condition of the citrus market, insure your profit by growing a quality crop of the better marketable sizes. Put SIZE and QUALITY into your fruit this year through proper applications of Chilean Nitrate of Soda to your trees. Chilean helps in four important ways...

(1) strengthens and invigorates the trees
(2) improves size and quality of fruit
(3) increases yield per tree
(4) offers economy in your fertilizer cost.

The Chilean Nitrate plan of fertilizing citrus trees will cut the cost of your fertilizer and increase its effectiveness. If you do not know about this plan, write us for complete details. Let us show you how it brings down the growing cost per box to a point where it pays to ship even in the face of low prices.

NATURAL . . . that's the Secret

Chilean is the natural nitrate. It is more than nitrogen. Thanks to its natural origin, it contains those valuable "impurities," Iodine, Boron, Magnesium, Potassium, Calcium, each a plant food in itself. It is the supernitrate . . . Nitrogen PLUS.

Now packed in 100 lb. bags. More convenient. Better condition. See your dealer. Say Chilean when you order and insist on Chilean. Two kinds . . . Original Chilean (Crystals) and Champion Brand (the pellet nitrate). Both are the genuine natural Chilean. Both are Nitrogen PLUS.

CHILEAN NITRATE OF SODA EDUCATIONAL BUREAU

Orlando Bank & Trust Bldg., Orlando, Florida
In writing for literature or information please mention Ad No. J-25

CRYPTOLATAEMUS LADY-BEETLES AS A CONTROL FOR MEALYBUGS

(Continued from page 5.)

ing off occurred. If whole potatoes are used, there appears to be enough moisture and food to carry the sprouts through the period of usefulness.

The "Red Bliss" potatoes were found to be best suited for this work. It is rather necessary to use a known variety which are well matured to insure prompt sprouting. Some potatoes of an unknown variety purchased at the market were very slow in starting to grow and when the sprouts did appear, they were of a purplish color and made very little growth. Mealybugs thrive much better on white sprouts. When well matured potatoes were used, the sprouts were up high enough in two weeks to inoculate them with mealybugs. It took as long as four weeks for less mature potatoes to start growing.

It is quite essential to infest the potato sprouts with mealybugs free from disease such as the fungus disease that attacks them in Florida. After a start of mealybugs has been made in the insectary, it is not necessary to bring new material in from the field. When flats of new sprouts were to be infested, the writer either transferred egg masses or took heavily infested sprouts and peeled them, laying the thin strips over the fresh sprouts. In twelve hours the mealybugs had crawled to the fresh material. In California temporary hosts are used; such as, wild sunflower, Australian pepper, and wild tobacco. Stems of these plants are placed in an infested flat, and when the mealybugs have crawled on them they are transferred to the new sprouts. The temporary host soon wilts and the young mealybugs move to the potato sprouts.

The flats were placed on racks which were so constructed that a space of one foot was left between each tier, leaving room for the sprouts and ventilation. The flats were in tiers of four high and could be slid in and out of the rack. The racks were built on legs so that they could be placed in pans of water to keep out invasions of ants.

The work at the Citrus Experiment Station was carried on in one of the basement rooms of the laboratory for lack of more space. It was heated by steam pipes which run through to other parts of the building. The temperature ranged from 60 to 85 degrees but 80 degrees appeared to be about the right amount of heat for the rapid growth of ladybeetles and mealybugs. It was noticed that the sprouts in the upper flats where the temperature was higher were always heavier infested with mealybugs than the lower ones. The top flats in the breeding cage also had more ladybeetle larvae than the lower ones. When the room temperature was as high as 80 degrees the adult beetles loose in the room, would gather near the heat pipes. With the approach of warm weather, no fire was needed to heat the building and the temperature during the day was about 65 degrees. At this temperature the mealybugs and beetles grew very slowly. At the present time a room in the insecticide building is being used. With the natural increase in temperature the insects are growing faster, but this room is not so satisfactory as the one in the laboratory was during the winter when there was heat day and night. In the present location the room is cool each night and during cloudy days. The room is kept almost dark to prevent the sprouts from turning green.

Three rooms would make a much more desirable arrangement for this work: one room in which to grow the potato sprouts and rear the mealybugs; the second for the adult beetles; and the third in which to rear the ladybeetle larvae. The first two rooms need no windows although ventilation should be provided. The third should have a window at one end to attract the young beetles when they emerge so they can be easily collected. When all three operations are carried on at the same time in one room, the adult beetles that escape from the cage are quite likely to find their way to sprouts that are just being infested with mealybugs and deposit eggs causing the young larvae to clean up the mealybugs before they mature.

As only one room was available for this work, a cage was built large enough to hold eight flats. The cage was covered with a 22 mesh copper wire screen and was used to handle the adult beetles. 20 beetles were placed in each of the eight flats of infested potato sprouts. The flats were allowed to remain in the so-called breeding cage for 20 days. At the end of that time they were removed and placed in the racks until the larvae had matured. Fresh material was put into the cage for the adults.

As the ladybeetle larvae are of a predacious nature, they should be as near the same age as possible in the individual flats. When beetles are in the pupa stage, they are defenseless; and young larvae are quite likely to devour them, especially if food is scarce. If the flats are allowed to remain in the breeding cage over a long period, the adult beetles continue depositing eggs, resulting in an over population of all ages of larvae. Before the larvae mature, they will have cleaned up the mealybugs, and then turned on each other or attack the pupae.

After the flats containing the larvae were removed from the breeding cage and placed in the racks,

Spray for
Aphis & Thrips
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It pays
big dividends
to SPRAY!
"Black Leaf 40" is the "Old Reliable" recognized control for Aphis and Thrips.
KILLS BY CONTACT AND FUMES
"Black Leaf 40" kills not only by direct contact (hitting) but in extra measure by the nicotine fumes. This "extra measure" of protection you cannot obtain from the non-violative insecticides.
Ask your Experiment Station.
Dealers Sell "BLACK LEAF 40" in several package sizes
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13
"Black Leaf 40"
40% Nicotine

strips of burlap were hung in front and back of the racks to which many of the maturing larvae crawled and attached themselves for pupation. Many of the larvae were attached to the sides of the flats and on the racks.

When the adults emerged, they gathered on a window that was screened with white cloth and were collected in a common test tube.

A duplicate of the breeding cage was built to house the young beetles. These beetles were later mixed with the older ones.

The average larvae matured in about 22 days and was in the pupa stage 12 to 14 days.

57 days elapsed from the date the first lot of 150 beetles were introduced on the infested potato sprouts until the majority of young beetles had emerged. There were approximately 2000 beetles (adult) in the first generation.

According to H. S. Smith and H. M. Armitage, the period of full oviposition of the beetles is six weeks; the majority of eggs are deposited during the third and fourth weeks. The larvae feeding is 12 to 20 days and the pupation period 8 to 12 days. One flat may produce from 400 to 1000 beetles but 400 is about the average.

The method of distributing the beetles in California is as follows: Small standard medicinal gelatine capsules were used, size '000' ⅜ inch diameter and one inch long. Ten beetles are placed in each capsule, as that number has been found sufficient for each tree. The beetles have lived in these capsules from five to seven days, but unless necessary, 72 hours should be the limit. The man distributing the beetles in the grove has the full capsules in one pocket. He then goes to each tree and throws the beetles into the center of the tree and places the empty capsules in the opposite pocket. It has been found that a more even distribution can be obtained in this way than by liberating them between the rows of trees.

The approximate date when the beetles should be liberated in Florida has not been worked out, but it should be just as soon as there are enough mealybugs to support them. The beetles should be at least two weeks old before being liberated so that the females will be more likely to deposit fertile eggs as soon as they find a colony of mealybugs.

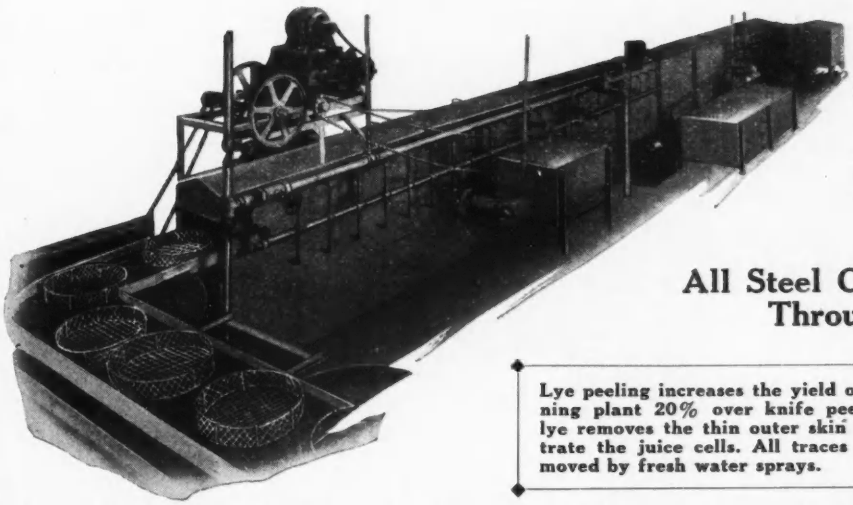
The reason for securing these beetles was not to combat the mealybugs on citrus alone, but for the other crop that is infested by this pest. When various bulbs are in storage, they are often attacked by mealybugs. By screening the bulb storage house and introducing the Cryptolaemus ladybeetles, a control of mealybugs should be obtained.

A small quantity of bulbs infested with mealybugs were placed in the room where adult beetles were loose. The beetles found the infested bulbs, young larvae soon appeared, and the mealybugs disappeared. Some of the matured larvae attached themselves to the bulbs for the pupation period. From all indications these beetles should be a big factor in solving the mealybug problem of the bulb growers.

The Cryptolaemus ladybeetle is best known as a predator of mealybugs, but it does not appear to restrict its diet to them alone. In the laboratory the larvae have been observed eating Citrus aphis (Aphis spiraecola Patch), melon aphis (Aphis gossypid Glover), the elder aphis sp. and Cottony cushion scale eggs and crawlers. Young larvae

(Continued on page 32.)

CITRUS LYE PEEL MACHINE



20% More from the same fruit over hand peel.

All Steel Construction Throughout

Lye peeling increases the yield of a grapefruit canning plant 20% over knife peeling methods. The lye removes the thin outer skin but does not penetrate the juice cells. All traces of the lye are removed by fresh water sprays.

This machine has a lye application section, fresh water section, rotary screen for circulated fresh water, fresh water circulating pump, lye mixing and heating section and 10 feet of tramrail for handling lye drum. Baskets of yellow peeled fruit are carried through machine on endless cables. Lye is applied by sprays on both top and bottom and then completely removed by fresh water sprays. The fruit leaves the machine clean of all rag and with only the bare juice cells exposed.

Write for a copy of our Canning Catalog—will be ready in a few weeks.

FLORIDA CITRUS MACHINERY COMPANY, Dunedin, Florida

ENFORCEMENT OF THE PLANT QUARANTINE ACT

(Continued from Page 7)

dahlias, etc.; by any person who is maintaining a notable general collection of plants of the nature of a botanic garden or arboretum which is freely open to the public and which serves a distinct educational purpose. Permits are also issued to botanic gardens, agricultural colleges, experiment stations, and other similar public institutions to meet necessary experimental, educational, or scientific needs.

It may be that the restrictions on the importation of plants by amateurs could safely be liberalized in some measure. If there is to be regulation of the entry of plants to prevent the indiscriminate importation of plant pests, there must be some rule which may be followed with justice to all in order that the purpose of the law may not be completely lost sight of. It seems reasonable that the State Horticultural Societies might well assume part of the responsibility for determining who, as amateurs, would be eligible to receive permits for the importation of plants from abroad. There is no disposition on the part of the Department to curb the desires and activities of the amateur plant grower, for the development of horticulture that has resulted from the efforts of the amateur is well understood and is applauded. The Department will welcome any suggestion which the Horticultural Societies of the country can develop, having for its purpose, if it is possible to work it out, a more logical, perhaps more uniform basis upon which permits may be issued for the importation by individuals of plants from foreign countries. Naturally, such a program must not in any way be permitted to increase the risk of pest introduction. There must be kept in mind at all times the purpose of the restrictions, which is to prevent the entry of injurious plant pests.

Accepting the mandate issued by Congress, the Department has undertaken to regulate entirely the importation of all plant products from abroad that might through the introduction of pests menace the agricultural and horticultural production of the United States.

In addition to the regulation of nursery products, a port inspection service has been set up. This service not only undertakes to inspect and pass or reject the commercial shipments of plant products offered for entry, but also prevents the bringing in of incidental or causal lots of plant products which are frequently much more dangerous than the commercial importation. There are at the present time inspectors located at all the principal ports of entry in the United States, including the ports of entry along the Mexican border and at strategic points along the Canadian border. At the Mexican border ports of entry during the fiscal year ending June 30, 1930, there were intercepted 26,100 separate lots of plant products prohibited entry into this country from Mexico by quarantine. At the maritime ports of entry there were inspected 21,058 ships from foreign countries. There were intercepted at these maritime ports of entry 18,609 lots of contraband plants and plant products. The building up of a port inspection service to the point which would permit of the proper inspection of commodities offered for entry and which would likewise permit the proper inspection to intercept those products that are brought into the country through ignorance or carelessness or through design to circumvent the quarantine laws, has been a slow process. Men have had to be trained. Transportation company employees have had to be educated to the importance not only of complying with the regulations but of assisting in their enforcement. Without the aid of the transportation companies, freely given, the work could not have been so successfully performed.

While Congress has been generous in making appropriations, the very nature of the work has been against speed in building up the service, due to the obstacles met in the securing of properly trained and qualified men and making arrangements for proper supervision. We have not yet reached the point where we can say that the service has assumed satisfactory proportions. The efforts of the Federal Government have of necessity been concentrated toward the taking care of those ports where large lots of material are offered for entry which have a wide distribution throughout the country. There are certain sections of the country which are much more exposed to danger of pest introduction from abroad than are these ports which receive products for wide distribution. Florida and California are notable examples of this condition. While much material reaches the ports in these States for ultimate distribution to other ports of the country, on account of the type of horticultural and agricultural production, and on account of favorable climatic conditions, these particular localities are more susceptible to infestation by a greater range of pests than are other sections of the country. While it cannot be disputed that this makes the protection of these parts essentially a national problem, it is by the same token true that the problem becomes one of equal local or state interest.

The introduction and establishment of foreign pests in these States is of primary consideration and of primary importance to the two States concerned. Realizing this, and with every desire to cooperate in the building up of a real national plant quarantine inspection service, the

States of Florida and California have maintained almost entirely at State expense the inspection service at the ports of entry in these two States. The inspectors all act under Federal authority as collaborators of the Plant Quarantine and Control Administration. Certainly until the service is built up over the United States to a greater degree than it has been possible to build it up to this time, it is to be sincerely hoped that Florida and California will continue to make this contribution to the plant quarantine work, which is not only of national interest but which first of all is of interest to the respective States.

Florida has experienced, as have few other states, the difficulties and expense which follow the establishment of injurious plant pests within the State. Two major plant pests have within the past twenty years found lodgement in Florida, and so far as is known neither pest at this time exists within the State of Florida. This is due, more than any other one thing, to the fact that there has existed in the State of Florida, an organization able and in position to immediately cope with situations of this kind. If there had been in the State of Florida no such organization as the State Plant Board or if there had been such an organization manned by a less able, less energetic personnel than the Plant Board of this State, it is entirely probable that both citrus canker and the Mediterranean fruit fly would have persisted much longer in the State than has been the case. Under any circumstances success would have been impossible without the splendid assistance which has been given by the growers, shippers, and associations of Florida.

The Plant Quarantine and Control Administration has enjoyed the hearty cooperation and assistance of the officials of the State of Florida, particularly the Governor and the State Plant Board, and of the agricultural organizations; certainly of the State Horticultural Society; and since all are working for a common good—the protection from pests in the development of the agricultural and horticultural industry of the country — this cooperative effort should continue.

THE CITRUS INDUSTRY is read because of the authentic information it carries concerning the industry it represents—that is why advertisers find it result producing.

WHAT MAKES IT PINK?

The Howey Tribune, published at Howey-in-the-Hills, says:

What makes a pink grapefruit pink and how does it get that way?

It appears that the composite answer from competent horticulturists and botanists is:

"You should worry, a grapefruit by any other color is just as good and will squirt just as far."

In other words, the pink part of it has little or nothing to do with the quality of the fruit.

I. B. Foster in 1906 at Manatee discovered a branch bearing pink fruit on a Walters grapefruit tree. The pink color in this variety is confined to the section membranes and often shows through the rind. It is known under the name of Foster.

E. F. Debusk, extension citrus pathologist-entomologist, calls attention to the fact that the Marsh seedless, developed from a sport, has produced a pink grapefruit with "no undesirable characteristics except that the pink coloring seems to fade out gradually."

Advertisers use THE CITRUS INDUSTRY for Results—and they get them.

Fertilizer Costs
Can Only Be Measured
By Effect On Crops

The cost of fertilizer per ton may mean nothing at all, but the result of having used the fertilizer just suited to your requirements means everything.

That's why so many of our customers are those who have purchased their fertilizer requirementts from us year after year.

They know that our field experts will advise them honestly and expertly as to the sort of fertilizer required to secure the best results for their particular grove.

They know that this company never sells anyone with the thought in mind that that single sale will conclude our relationship. With us the initial sale is simply the entering wedge to a long and pleasant relationship builded upon a mutual confidence and respect.

If you don't know us well as you should we will both profit measureably by becoming better acquainted.

West Coast Fertilizer customers raise better fruit.

West Coast Fertilizer Co.

303 Zack Street Tampa, Florida

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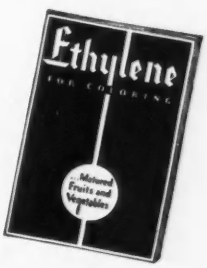

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WITH ETHYLENE

This free book shows you how Ethylene:

1 Increases profits
2 Reduces loss
3 Saves time
4 Saves money
5 Is neither injurious nor dangerous
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CRYPTOLATÆMUS LADY-BEETLES AS A CONTROL FOR MEALYBUGS

(Continued from page 29.)

placed on aphis infested orange trees reached maturity in 20 days. Adult beetles lived on citrus aphis in the laboratory 27 days, eating from four to 42 aphis per day; the larvae eating from zero to 40 per day. The average was 16. Several hundred larvae of all ages were fed nothing but citrus aphis for a month, or until all the larvae had matured.

As previously stated in this paper, it is the desire of the Experiment Station to establish these beetles in the state. The rearing of large numbers of beetles artificially will have to be done by individual growers, or groups of growers, as the Department does not have the funds or facilities to carry this work on in a large scale. Since the mealybugs attack a number of different plants in the state and the beetles have a rather wide range of diet, it is quite possible that they can become established and therefore be of economic importance to our horticulture industry.

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CITRUS RECIPES

Use Oranges, Bananas, Grapefruit, to Make Excellent Jam and Jelly Now

Spring has been with us for some weeks, officially, but she hasn't grown mature enough yet to ripen many crops.

So, while waiting for her sunshine to tint strawberries, why not put up those semi-tropical fruits which are now luscious and plentiful?

Oranges, lemons, bananas, and grapefruit make excellent jams and jellies, and, with the short-boil method you can easily fill your cupboard with enough preserves to tide you over until the new fruits are in. Also, you will be that much ahead in your preserving when the rush starts.

Use these tested recipes to insure success.

Orange and Pineapple Jam

4 cups (2 lbs.) citrus and pineapple mixture

7 cups (3 lbs.) sugar

½ cup bottled fruit pectin

Add grated rinds and juice of 2 oranges and 2 lemons to crushed or finely chopped pineapple (fresh or canned). Measure fruit mixture into large kettle. Add sugar, mix, and bring to a full rolling boil, stirring constantly. Boil hard 1 minute. Remove from fire and stir in pectin. Stir for just 5 minutes to cool slightly. Pour quickly. over hot jam with film of hot paraffin; when jam is cold, cover with ⅛ inch of hot paraffin. Roll glass to spread paraffin on sides. Requires 1 medium pineapple or 1 No. 2 can pineapple. Makes 10 eight-ounce glasses.

Orange and Lemon Jelly

2½ cups (1¼ lbs.) juice and water

6 cups (2½ lbs) sugar

1 bottle fruit pectin

Use 4 oranges and 2 lemons. Add juice to grated rinds and let stand 10 minutes. Press juice through cloth. Measure juice and water and sugar into large saucepan, stir, and bring to a boil. At once add pectin, stirring constantly, and bring again to a full rolling boil and boil ½ minute. Remove from fire, let stand 1 minute, skim, pour quickly. Cover hot jelly with film of hot paraffin; when jelly is cold, cover with ⅛ inch of hot paraffin. Roll glass to spread paraffin on sides. For a soft, very slow set use ½ cup less sugar. Makes about 8 eight-ounce glasses.

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TUNG OIL TREES—Cluster variety. Vigorous. Forty cents each. Lots of hundred 30 cents each. Hunt Bros., Inc., Lake Wales, Fla.

ORANGE PACKERS ATTENTION: — Two chemical transparent flexible orange coating processes for sale; royalty or license basis. Patent pending. Dr. C. V. Berry, 251 West 111th Street, New York City.

APHIS, ONE OF THE MOST INTERESTING OF INSECTS

(Continued from Page 27)

sucking sap or plant-juice much as the mosquito draws blood from an animal. Because of this fact the Aphis will pierce the skin of the tiny developing fruit and draw sap from it. The result is what is known as an "Aphis apple". These injured specimen never grow to large size and it takes 1500 to 1600 "Aphis apples" to make a bushel. The orchardists frequently use "Black Leaf 40" mixed with other sprays in combating Aphis pests.

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